2014 ASEBIO Report

News and trends from the Spanish Biotech Sector and company guide

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2014

ASEBIO Report

News and trends from the Spanish Biotech Sector and company guide

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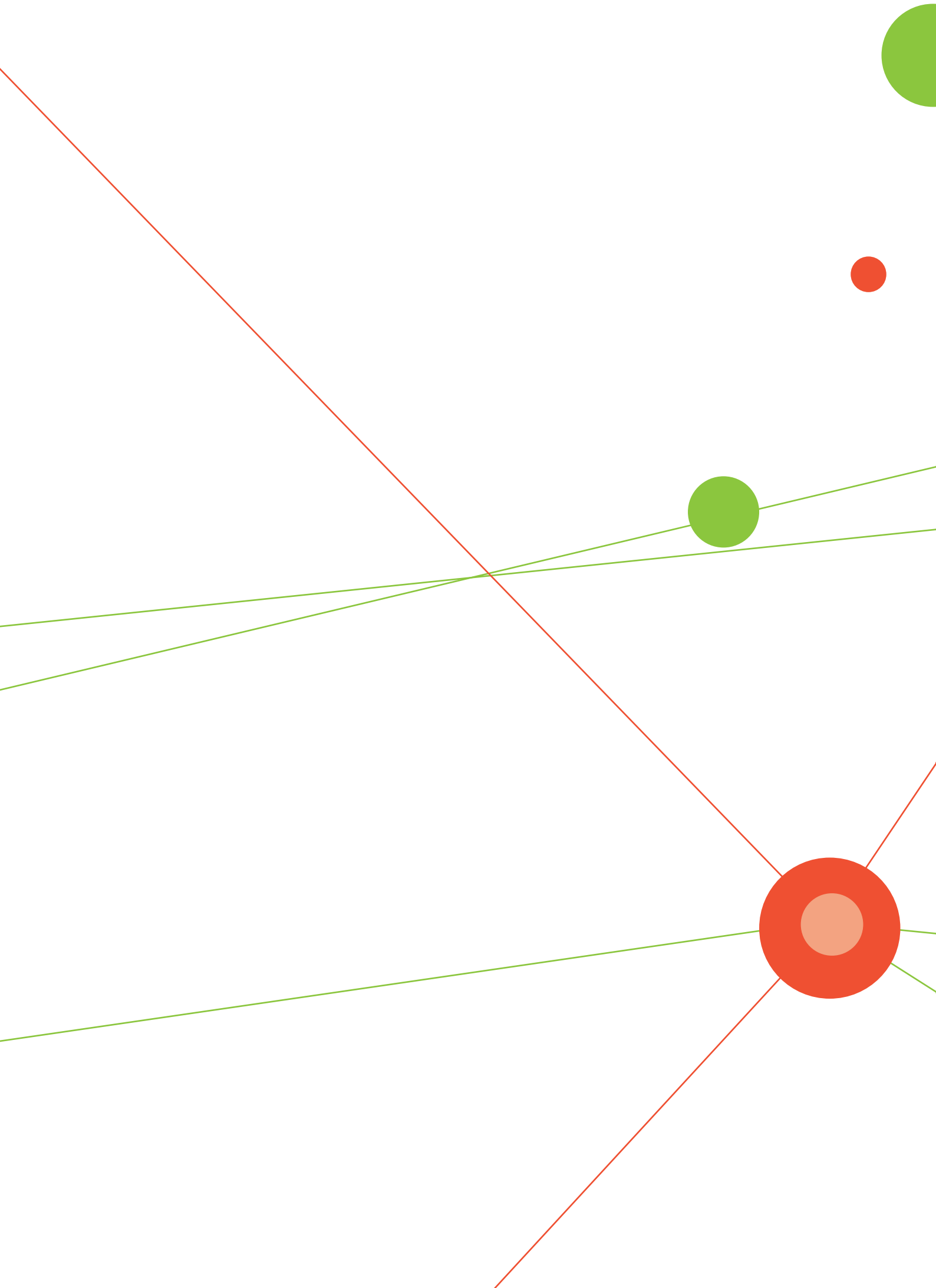
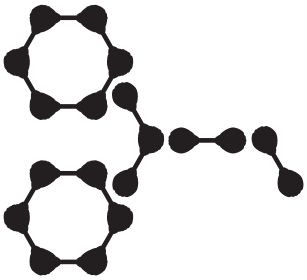




1 The Spanish biotechnology sector in 2014

1. The Spanish biotechnology sector in 2014

The figures in this year's report reveal that the sector is going through a difficult period and shed light on negative results in the evolution of key indicators:

- The number of companies declaring that they are engaged in biotechnology activity has fallen significantly, it is down by -7.77%, to 2,831 businesses (239 less than last year).
- 554 companies, meanwhile, declare biotechnology to be their main or exclusive activity (the *biotechs*), a significant drop of -11.42% from 2012 (71 companies less), a confirmation of the downward trend which started in 2012.
- In net terms, 30,037 jobs have been lost during 2013 (a reduction of 15%), making this the first overall decrease of the number of jobs in the history of the sector.
- *Biotechs* have suffered the most over the last year, with a loss of 5,206 jobs (-14.95%) and 19.2% less turnover.
- Internal expenditure on R&D has fallen for another year (-1.68%) although at a slower rate compared to previous years (-2.7% in 2012 and -5.3% in 2011).
- In spite of all this, turnovers among biotechnology user companies in 2013 have risen to 95,152 million euros (+18.48%), the rise is mainly due to companies of over 250 employees, a group which is responsible for over 85% of the total turnover. The contribution to the GDP by biotechnology user companies has increased to 9.07% from 7.8% in 2012 (we should remember that in 2008 this indicator was under 3%).

Table 1 shows the evolution of the key indicators for the biotechnology sector. Figure 1 and Figure 2 show the evolution of employment and turnover in recent years. Table 2 compares the results of the same indicators according to whether biotechnology is the main or exclusive activity (*biotechs*), a secondary activity or just a necessary tool for production.

Table 1. Main results from the biotechnology section of the 2013 survey on innovation in the private sector

Main variables	Under 250 employees	Over 250 employees	Total 2013	Total 2012	Variation	Growth rate
Companies active in biotechnology	**2,729**	**102**	**2,831**	**3,070**	**-239**	**-7,77%**
Dedicated biotechnology companies using biotechnology as main or sole activity	533	21	**554**	625	**-71**	**-11,42%**
Biotechnology companies using biotechnology for a second line of business	247	24	**271**	288	**-17**	**-5,90%**
Biotechnology companies using biotechnology as a tool for production	1,949	57	**2,006**	2,156	**-150**	**-6,95%**
Companies active in biotechnology R&D	**914**	**70**	**983**	**1,036**	**-53**	**-5,10%**
Total employment	**65,799**	**107,140**	**172,939**	**202,976**	**-30,037**	**-14,80%**
Turnover (in millions of euros)	**14,098**	**81,055**	**95,152**	**80,312**	**14,840**	**18,48%**
Number of biotechnology R&D staff	**6,896**	**2,237**	**9,135**	**8,988**	**147**	**1,63%**
Total by role						
Researchers	3,935	1,213	5,148	5,370	**-222**	**-4,13%**
Technicians and assistants	2,961	1,026	3,987	3,618	**369**	**10,19%**
B) Number of women	**3,761**	**1,334**	**5,095**	**4,976**	**119**	**2,38%**
Researchers	2,044	686	2,730	2,839	**-109**	**-3,81%**
Technicians and assistants	1,716	648	2,364	2,137	**227**	**10,61%**
Internal expenditure in R&D (in thousands of euros)	**370,426**	**144,103**	**514,529**	**523,344**	**-8,815**	**-1,68%**
A) Type of expenditure						
Operating expenses	330,926	137,772	468,698	463,956	**4,742**	**1,02%**
- Salaries for researchers	130,079	54,240	184,319	185,050	**-731**	**-0,39%**
- Salaries for technicians and assistants	64,868	28,638	93,506	84,368	**9,138**	**10,83%**
- Other operating expenses	135,979	54,894	190,873	194,539	**-3,666**	**-1,88%**
Capital expenditure	39,501	6,331	45,832	59,387	**-13,555**	**-22,83%**
- Land and buildings	7,938	1,120	9,058	24,988	**-15,930**	**-63,75%**
- Equipment and devices	30,186	4,999	35,185	32,542	**2,643**	**8,12%**
- Specialised R&D software	1,377	212	1,589	1,858	**-269**	**-14,45%**
B) Sources of funding						
Funding from Spain	310,527	120,586	431,113	447,095	**-15,982**	**-3,57%**
- Own funds	216,103	98,074	314,177	300,515	**13,662**	**4,55%**
- Companies	32,929	10,271	43,200	33,389	**9,811**	**29,38%**
- Public funding	56,998	10,772	67,770	105,373	**-37,603**	**-35,69%**
- Universities	194	53	248	665	**-417**	**-62,77%**
- Private non-profit institutions	4,303	1,416	5,719	7,153	**-1,434**	**-20,05%**
Overseas funding	59,899	23,517	83,416	76,249	**7,167**	**9,40%**
- EU programmes	13,615	1,277	14,892	17,407	**-2,515**	**-14,45%**
- Other overseas funding	46,285	22,240	68,524	58,842	**9,682**	**16,46%**

Table 2. Main indicators for the biotechnology sector in 2013 by type of activity

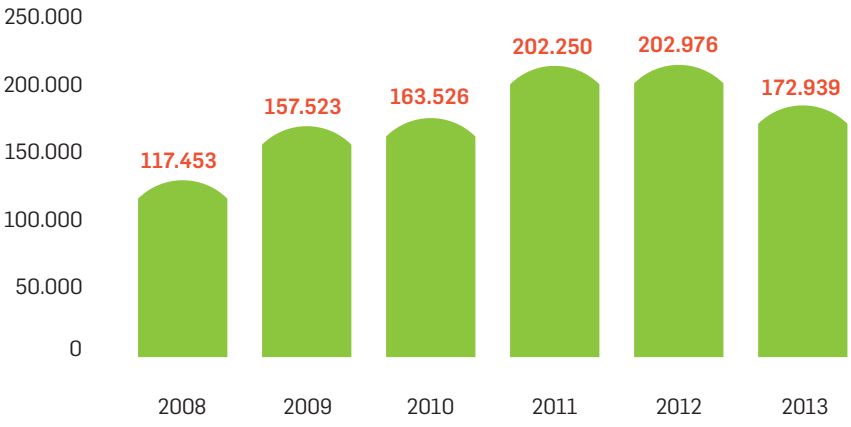
Main variables	Principal			Secondary			Tool			Total in 2013	Total in 2012
	Value in 2012	Value in 2013	% over total in 2013	Value in 2012	Value in 2013	% over total in 2013	Value in 2012	Value in 2013	% over total in 2013		
Units active in biotechnology	625	**554**	19.57%	288	**271**	9.57%	2,156	**2,006**	70.86%	**2,831**	3,070
Units active in biotechnology R&D	465	**495**	50,36%	205	**200**	20.35%	366	**288**	29.30%	**983**	1,036
Number of jobs biotechnology R&D	7,141	**6,619**	37.72%	2,016	**2,049**	11.68%	8,028	**8,882**	50.61%	**17,550**	17,185
Expenditure in biotechnology R&D (in thousands of euros)	535,736	**522,320**	61.75%	112,908	**92,290**	10.91%	204,542	**231,227**	27.34%	**845,837**	853,186
Internal R&D expenditure in biotechnology (in thousands of euros)	353,373	**371,259**	72.16%	74,878	**68,719**	13.36%	95,093	**74,552**	14.49%	**514,529**	523,344
Turnover (in thousands of euros)	8,801,580	**7,111,375**	7.47%	38,387,308	**62,493,746**	65.68%	33,123,662	**25,547,334**	26.85%	**95,152,455**	80,312,549
Total employment	34,827	**29,621**	17.13%	49,848	**54,538**	31.54%	118,301	**88,781**	51.34%	**172,939**	202,976

Table 1 reveals that the key indicators for the biotechnology sector experienced significant falls over 2013, with the most worrying numbers being the decrease in companies and the loss of jobs, particularly among *biotechs* (those companies whose main or exclusive activity is biotechnology). It confirms the change in the trend identified in the previous ASEBIO report.

For the first time in the history of the sector, the number of companies declaring biotechnology activities over the year fell, by 7.7%. The number of *biotechs* has also fallen, by -11.42% (in absolute terms this means 71 less biocompanies), another confirmation of the downward trend started in 2012, when the number of biocompanies fell by 5.3%.

If we focus exclusively on the *biotech* firms, it is clear that these companies have suffered most over the last year, as is illustrated by the loss of 5,206 jobs (14.95%) and the 19.2% fall in turnover compared to the previous year.

Figure 1. Employment (number of employees)



In spite of the disappointing results outlined above, the total turnover for biotechnology user companies has continued to grow strongly (+18.48%). This growth is attributed to those companies with over 250 employees, a group which has grown by 21.72% and accounts for 85% of the total turnover

of the sector. Although the turnover data is very positive it should be interpreted with caution, as the category of *biotechnology user companies* includes all the sectors which use biotechnology (food, pharmaceutical, chemicals, energy, etc.) and a large proportion of the corporations in said sectors.

In terms of the sector's contribution to GDP (the turnover of biotechnology user companies as a proportion of national GDP), once again, the ratio continues to grow, now up to 9.07% of the GPD at constant prices (in contrast to 7.61% in 2012 and just 2.91% in 2008). We should also exercise caution towards the figure for total business in the sector and bear in mind the 1.2% GDP fall in 2013 (which partially explains the increase in turnover/national GDP ratio).

From a methodological perspective we should also consider that this indicator is revised and updated every September, with the definitive number being released four years later (i.e. the definitive GDP for 2013 will be determined in 2017), although usually revisions are not significant. However, in September 2014, new statistical rules were introduced, leading to a revision of all totals back to 1995. This has meant a slight change in the size of the sector to GDP ratio for the last few years when compared to the numbers published in previous reports.

To conclude this overview on the breakdown of turnovers for the sector, the latest survey by the Spanish Statistical Office shows that 65.58% of the turnover is generated by firms which state that biotechnology is a secondary line of business, while 26.85% is attributed to companies which consider biotechnology to be a necessary tool for production, with *biotechs* only accounting for 7.47% of the total turnover for the sector (compared to 11% in the previous year).

In terms of employment, meanwhile, the type of company is more significant

Figure 2. Turnover (in millions of euros)

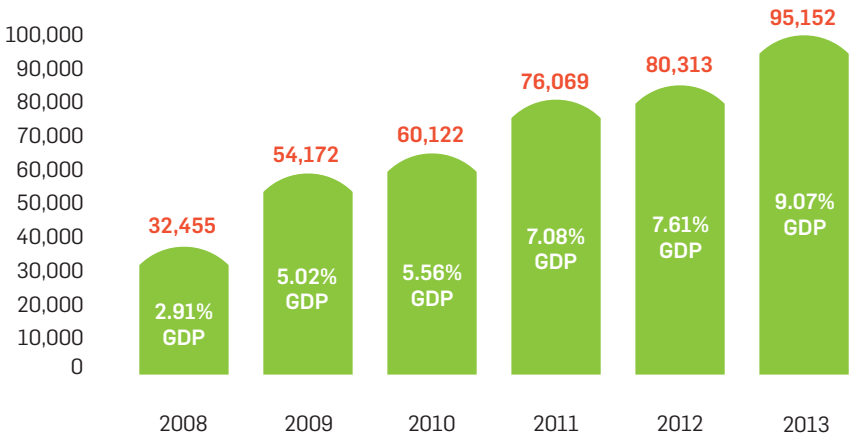


Figure 3. R&D expenditure (in millions of euros)

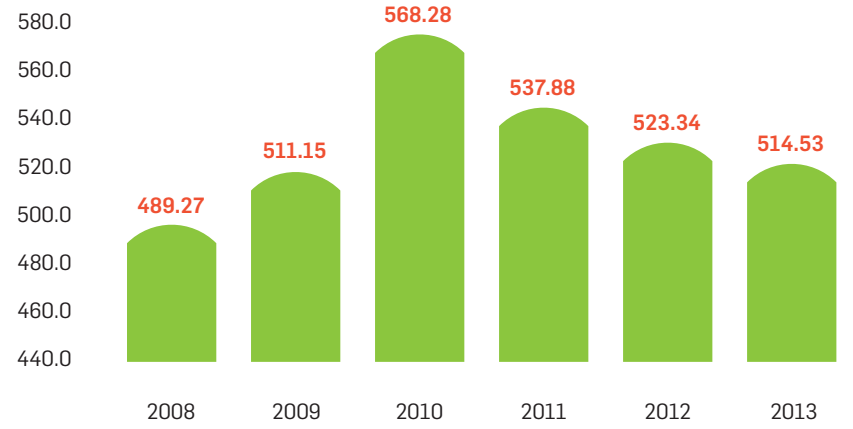
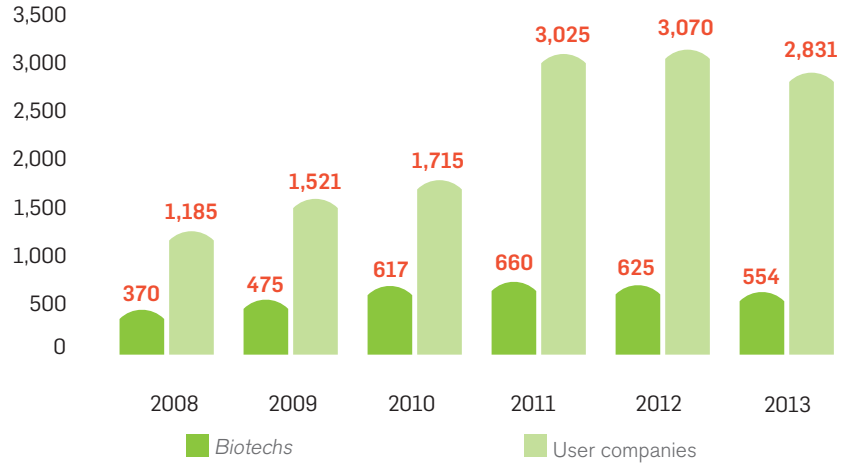


Figure 4. Number of companies active in biotechnology



than turnover: tool for production activity accounts for 51.35% of jobs in the sector, the secondary activity category contributes 31.54%, while main activity provides 17.13% of jobs.

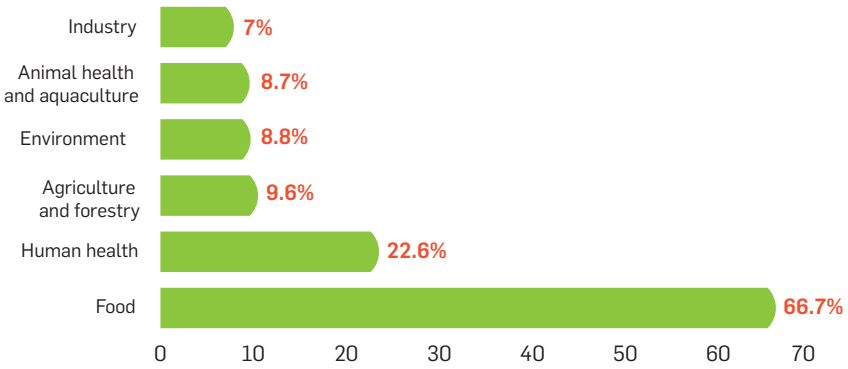
Another indicator which the ASEBIO Report follows closely is the evolution of internal R&D expenditure, which is considered to be a key element for the future competitiveness of the sector. As Figure 3 shows, the downward trend continued over 2013 with a decrease of -1.68%, a smaller reduction than in previous years (-2.7% of 2012 and -5.3% in 2011), but a figure which puts this key indicator back to 2009 levels. In terms of the sources of funding, the drop in R&D expenditure must be attributed to the sharp fall (-35.7%) in investment/public procurement by national and regional administrations, while investments by other companies and through own funds have increased, up to 29.4% and 4.55% respectively.

Digging further into the sources of R&D investment reveals that it mainly comes from national sources of funding (83.79%) as it also did in previous years. The proportion contributed by national sources of funding remains similar to previous year: own funds (72.88%), public administrations (15.72%), other companies (10.02%) and non profit private entities and universities (1.33%). Note should be taken of the meagre contribution of 15.72% by the public administrations, a record low after a 35.7% fall compared to the previous year and 52.67% compared to 2010.

In regards to gender, for the fifth consecutive year in a row the number of women working in biotechnology R&D remains at 55-56%.

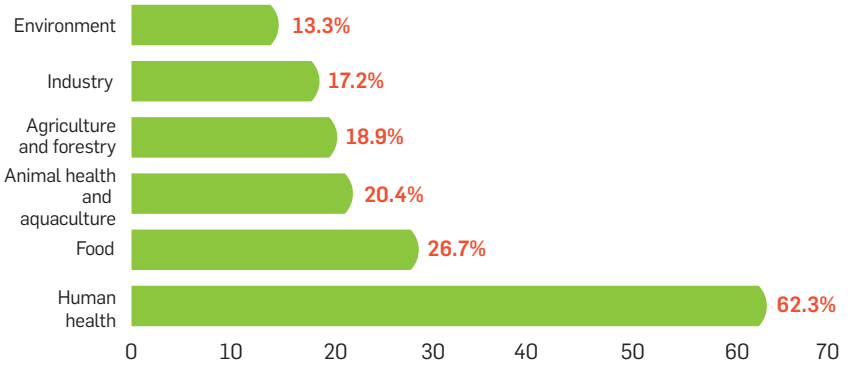
Rounding things off, Figure 5 and Figure 6 show the sectorial distribution of biotechnology user companies and the *biotechs*. As in previous occasions, the food sector predominates with 66.7%, followed by human health (22.6%) for biotechnology user companies, while the order is reversed for the *biotechs*: human health making up 62.3% and food 26.7%.

Figure 5. Percentage of user company by final application of biotechnology



Source: Spanish Statistical Office, Innovation Survey in Companies 2013.

Figure 6. Percentage of biotechs by final application of biotechnology



Source: Spanish Statistical Office, Innovation Survey in Companies 2013.

A geographical analysis of the indicators

Figure 7 shows that Catalonia (14.89%) still leads the ranking for biotechnology user companies, followed by Madrid (12.13%) and the Basque Country (11.88%). A second group is headed by Andalusia (9.27%) followed by Galicia (7.74%), Castile-La Mancha (7.22%), Castile-Leon (6.62%) and Valencia (5.37%).

From a methodological perspective, this year we should again bear in mind that regions with less developed manufacturing sectors show significant variations compared to previous reports. This is particularly noticeable in Castile-La Mancha, a region that, although its regional government has shown a commitment to industrial biotechnology through the CLAMBER project, does not stand out for its biotechnology production - yet it has jumped from 142 firms to 204. The results could be attributed to the random sampling approach

used for the survey; in 2010 the Spanish Statistical Office changed the methodology so that rather than using census data, the statistics for its surveys would be collected using random sampling.

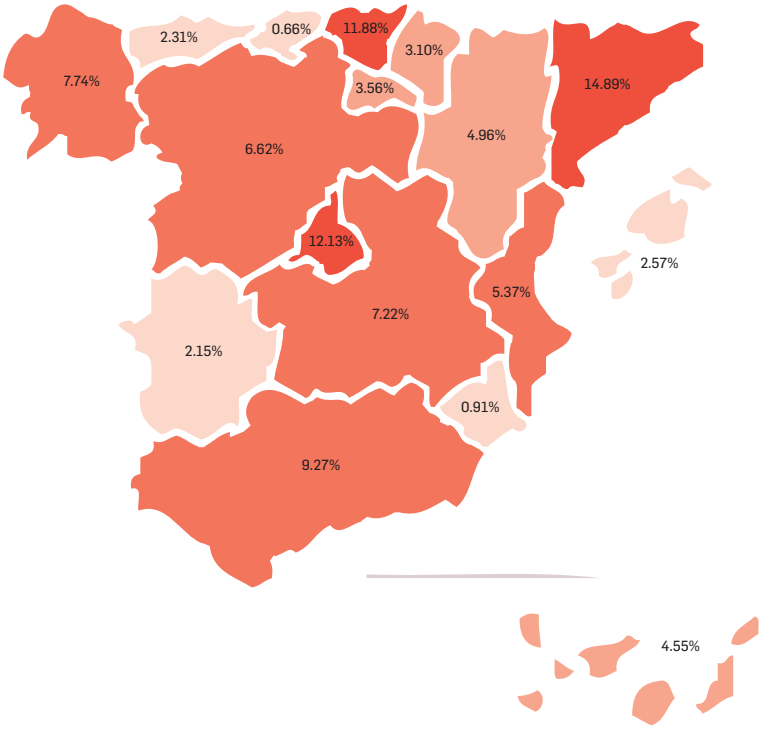
Figure 8 shows that the geographical distribution of the leading group for *biotechs* follows a similar pattern as that of user companies. Catalonia heads the ranking with 19.43% of the total, followed by Madrid (17.53%), Andalusia (15.49%) and Valencia (10.09%), which joins the leading group at the expense of the Basque Country. The second group is made up of the Basque Country (8.41%), Castile- Leon (6.39%), which joins the group - and Galicia (6.23%).

Competitive cooperation in the Spanish Biotechnology sector

This section looks at the *innovative biotechnology companies;* those which responded that they brought about technology innovation - either products or processes - through the use of biotechnology during the two years prior to the survey. Out of the 554 companies which in the Biotechnology Survey identified biotechnology as their main or exclusive activity (*biotechs*) in 2013, 47.65% responded that they had been involved in technology innovation over the two previous years (2011-2013). Of those, 186 participated in some sort of collaboration with another entity. Figure 9 takes a close look at who these other participating entities are, as well as which of them have been most active in such collaborations with innovative biotechnology companies.

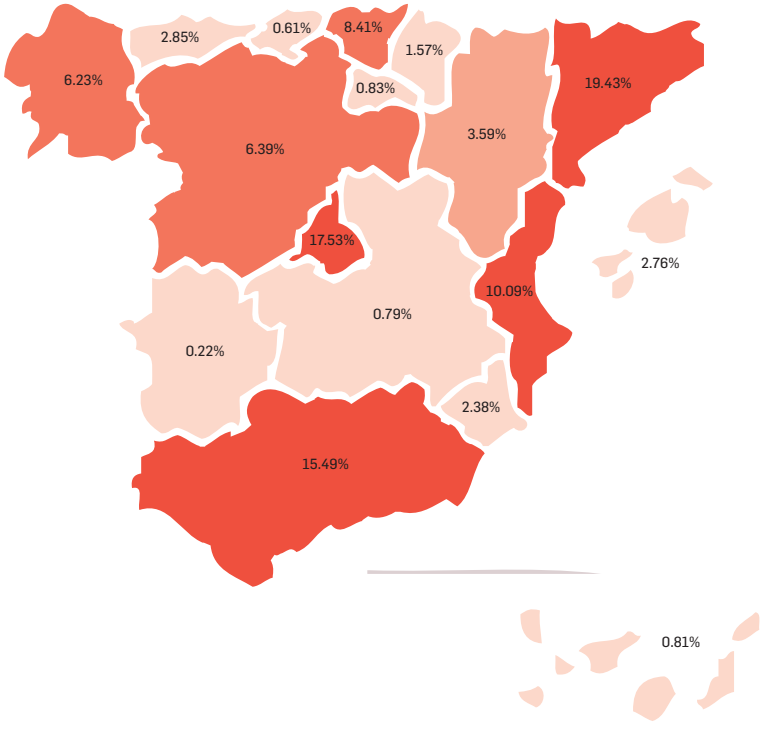
Like last year, collaborations with public sector bodies head the list: universities and other, largely public, higher education institutions (70.56%), followed by public research institutions (64.59%).

Figure 7. Geographical distribution of biotechnology user companies



Source: Spanish Statistical Office, Innovation Survey in Companies 2013.

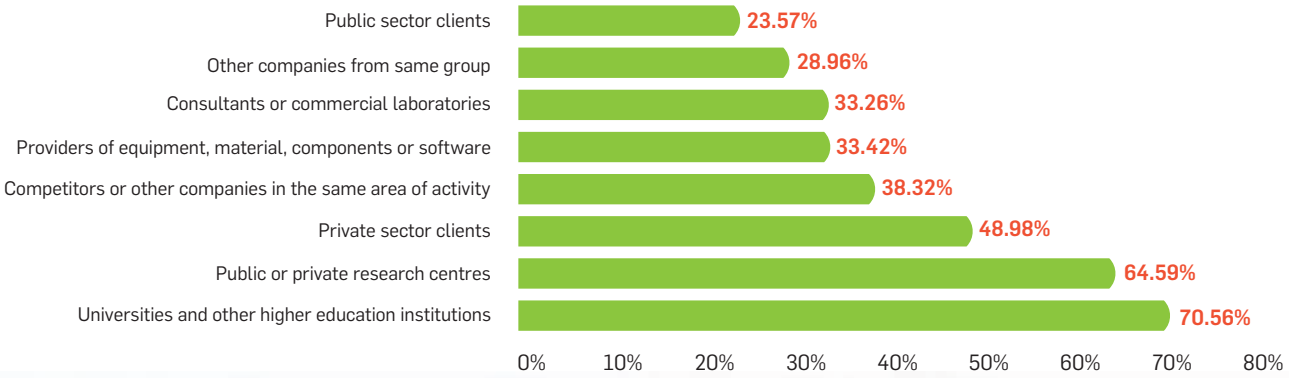
Figure 8. Geographical distribution of *biotechs*

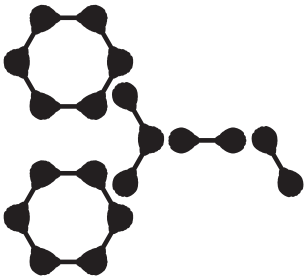


Source: Spanish Statistical Office, Innovation Survey in Companies 2013.

Coming in second, according to the data, are collaborations with clients, competitors, providers, consultants or laboratories, other firms owned by the same group, and public sector clients (see Figure 9).

Figure 9. Innovative biotechnology companies that cooperated for innovation during 2010-2013 period by collaboration partners





2

Companies launched in 2014

2. Companies launched in 2014

A total of 58 biotechnology companies started operating in 2014. Table 3 lists them by company name and area of activity.

The following entities have assisted ASEBIO in compiling the list: BIC (CEEI) Asturias, Área de planificación sectorial de la Junta de Castilla y León, Bioregion of Valencia (BIOVAL), Madrid Science Park, Clúster Tecnológico Empresarial de Ciencias de la Vida (BIOGA), BIOCAT, Dirección General para la Innovación Consejería de Industria, Innovación y Empleo del Gobierno de La Rioja, the Basque Business Development Agency (SPRI), Instituto de Fomento Región de Murcia (Regional Development Agency), Grupo Sodercan, Chamber of Commerce of Cantabria, Clúster Biotecnológico de las Islas Baleares (Bioibal), Canary Islands Special Zone (ZEC), Agency of Innovation and Development of Andalusia IDEA and the Albacete Science and Technology Park.

In terms of business creation, it is Andalusia that saw the largest number of new companies, with a total of 15, followed by the Basque Country and Catalonia with 11 each, and Galicia, where six new companies were launched. Five new companies were created in Valencia and another three in Madrid.

Table 3. Biotechnology companies launched in 2014

Company	Autonomous Community	Activity
AGROINDUSTRIAL KIMITEC	Andalusia	Biotechnology products for agriculture
ALEOVITRO	Basque Country	Development of bio-stimulants for the improvement mycorrhizal plants
Anélida Biotecnología	Galicia	Research and experimental development of biotechnology for agriculture
Aninling	Catalonia	Improvement of methods for *Next Generation Sequencing* to integrate molecular data into biological information.
BAIGENE	Basque Country	Initiative to improve athletic performance, based on recent advances in genetics and new digital technologies.
BIOENGINEERING SOFTWARE	Andalusia	Bioinformatics.
BIOMEDICA MOLECULAR MEDICINE	Madrid	Biomedicine research, development and innovation.
Biosfer Teslab	Catalonia	Development of in vitro diagnostic tests for the improved assessment of cardiovascular risk in high-risk patients.
Burumart Commerce	Basque Country	Development of probiotic cultures.
Butler Scientifics	Catalonia	Develops technologies to make scientific and clinical research easier, faster and more effective
CENITSS	Castile-Leon	Molecular biology and analysis of research data
Detection and Radiation Tecnologies (DART)	Galicia	Development, production and commercialisation of ionizing radiation detecting systems for medical and industrial applications.
DIAGNOSTICO Y APLICACIONES DE VETERINARIA SL (DIAVET)	Madrid	Specialised in the detection and treatment of allergy and bacterial infections in dogs, cats and horses.

Table 3. Biotechnology companies launched in 2014 (cont.)

Company	Autonomous Community	Activity
DNA Alliance	Valencia	Leading genetic laboratory, which provides diagnostic solutions through its wide range of tests, in-depth knowledge of genetics, and expert advice for medical professionals.
EPIDISEASE	Valencia	Technology R&D and commercialisation of products and services based on genetic and epigenetic principles in molecular diagnostics for medical ends.
EVOLUTION AND GENOMICS TECHNOLOGIES	Basque Country	Development and production of highly efficient enzymes for the energy efficiency market and high cosmetics.
GoodGut	Catalonia	Products to support the diagnosis and treatment of digestive diseases through analysis of the intestinal microbiota.
HELTH EUGENIA (CELULIFE)	Valencia	Research and cryopreservation of stem cells for a future autologous use.
HGC BIOMEDICAL RESEARCH DIAGNOSTIC	Andalusia	Molecular biology laboratory. Services for the diagnosing of infectious diseases and pathogens, molecular markers of tumour diseases and genetic database. Test development on demand.
I+MED S.Coop	Basque Country	Experts in hydrogel and optimised products for health professionals' every need. Development and manufacture of injectable hydrogels for controlled drug release - to improve the patients quality of life.
I-grape Laboratory	Galicia	Production and commercialisation of natural extracts.
IKERPHARMA SYNTHESIS	Basque Country	Design, synthesis and development of new epigenetic drugs in the oncology area and chemicals services with high added value for companies in the chemicals and pharmaceutical industries for the development of new molecules.
iMARE NATURAL	Andalusia	Development and optimisation of techniques for the production, breeding and fattening of fish, shellfish, algae, natural, chemical and / or biotechnology products, as well as any species useful for aquaculture exploitation.
Innovex Therapeutics	Catalonia	Valorisation of exosomes and extracellular vesicles as new platforms for the development of vaccines and / or diagnostic tools.
INSTITUTO DE INVESTIGACIONES NEUROBIOLÓGICAS NEUROBIA	Andalusia	Biomedical research and assistance in the neuroscience field.
INYCOM Biotech	Aragon	Research, development and production of monoclonal antibodies, cell cultures and kits for the detection and quantification of molecules with biotechnological interest for the human health, veterinary, environmental and food industries.
LAURENTIA TECHNOLOGIES	Valencia	Sustainable nanomaterials. Encapsulation and controlled release of active ingredients. Activation and modification of surfaces.
Leading Smart Health Technology	Galicia	Research, development and commercialisation of software products for the medical and health sector.
Lean Bio	Catalonia	Process development and scale-up for manufacturing biological products and bio-based synthesis of small molecules. Manufacture of probiotics starters, extracts, enzymes and recombinant proteins.
Magbiotek	Murcia	Development and production of kits for the purification of DNA and other nucleic acids and functionalised magnetic particles with various applications
MEAL FOOD EUROPE	Castile-Leon	Extraction of chitin from *Tenebrio molitor.*

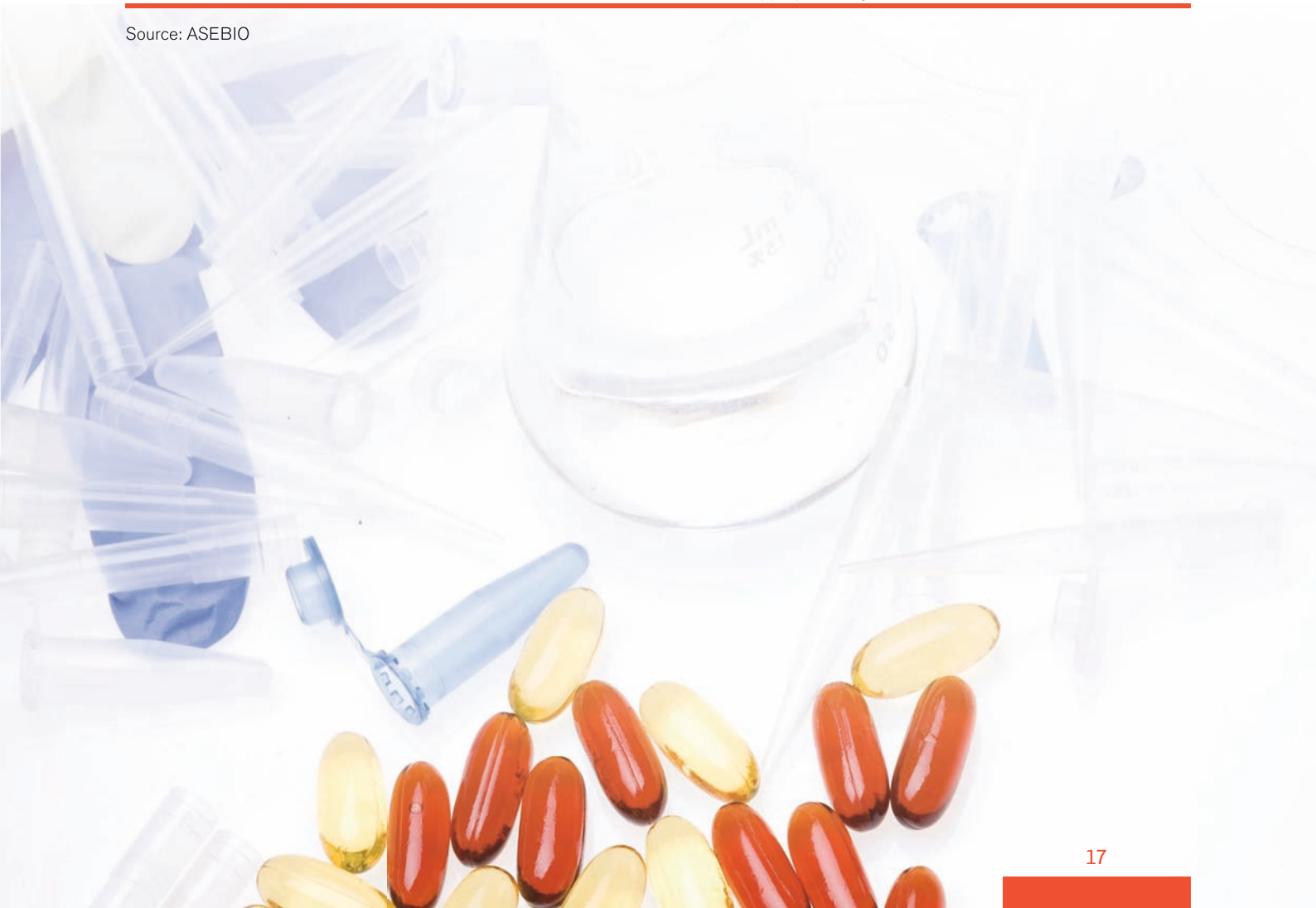
Table 3. Biotechnology companies launched in 2014 (cont.)

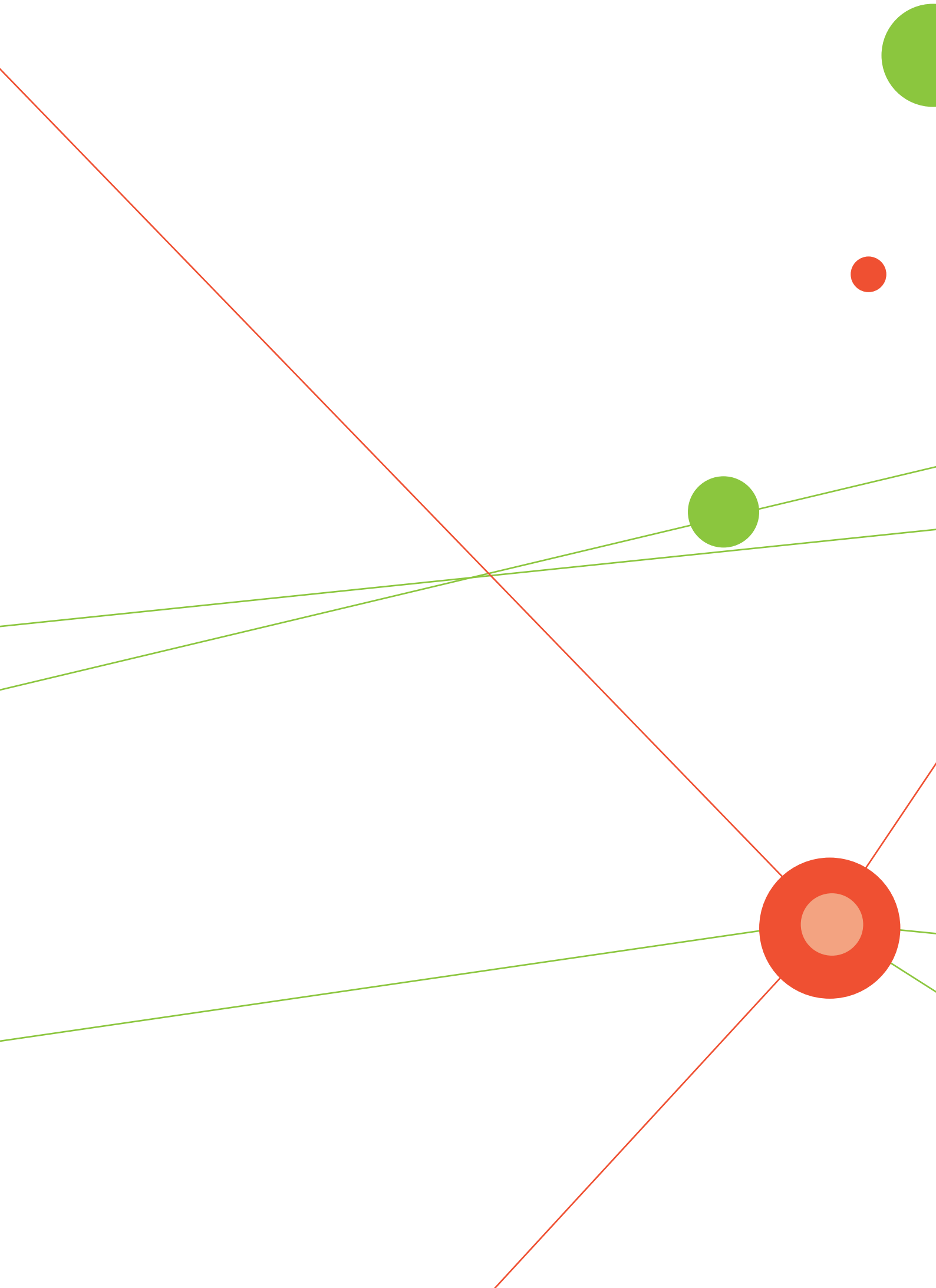
Company	Autonomous Community	Activity
MICROBIOTECH	Valencia	Specialists in the field of microwave energy for heating in near-field.
Myogem	Catalonia	Manufacture and commercialisation of drugs, dietary supplements and functional foods mainly to improve the health of people affected by rare diseases.
Nanovex Biotechnologies	Asturias	Biodesign, development and characterisation of nanomaterials (including nanovesicles and metal nanoparticles) which can be modified with different molecules of biological interest. Encapsulation services of compounds into nanovesicles.
Neexen Diagnostics	Andalusia	Development of diagnostic methods for human disease. The first product is aimed at the early detection of Alzheimer's disease.
Nepsia Therapeutics	Andalusia	Pharmaceutical development of neuroprotective compounds.
NEURODIGITAL TECHNOLOGIES	Andalusia	Product development and technology services for research in neuroscience and related disciplines.
NOVGEN	Andalusia	Use of internet as platform for the application genomic medicine in translational medicine through diagnostic and treatment tools using the latest advances in genetics.
Petnomic	Murcia	Animal genomics. Molecular diagnosis in the field of animal health and production. Development and commercialisation of tools for the treatment and diagnosis of animal diseases, prevention and population control, design of biomedical and biological materials. Animal genetics research.
Protein Bio-Technologies	Asturias	Management and development of all kinds of substances, products and by-products from animals for supplies through biotechnology developments that allow their processing, marketing and use in the industry in general and in the pharmaceutical in particular.
Proteus Diagnostics	Catalonia	Development and commercialisation of veterinary and human diagnostics tools (including molecular diagnostics).
PTR VALORIZACIÓN, FERTILIZANTES E INVESTIGACIÓN AGRÍCOLA	Andalusia	Waste treatment plant for the production of fertilizers and biogas.
QKSUR BIOGESTIÓN	Andalusia	Biological pest control.
Qubiotech, Health Intelligence	Galicia	Quantification and processing software for brain MRI and PET studies.
SDPOMF	Basque Country	Diagnosis service for oral and maxillofacial pathologies. Studies and analysis for the detection and treatment of oral cancer and research of oral diseases.
SIGMA BIOTECH	Andalusia	Design and development of innovative food projects to meet the needs of R & D companies working in the food industry sector.
SIMCOSMETIC	Madrid	Specialises in dermo-cosmetic industry with the ultimate goal of developing new formulations based on natural ingredients with high added value. Developing in silico platforms based on biological systems able to predict complex synergistic activities of active ingredients.
SOLUCIONES ETOKÉ	Andalusia	Etoke is a newly patented process for the production of foods which, using a Functional Mix, allows the production of traditional foods in a more efficient and economical manner while maintaining or even improving their nutritional and organoleptic properties.

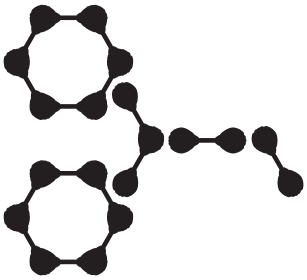
Table 3. Biotechnology companies launched in 2014 (cont.)

Company	Autonomous Community	Activity
SOMAPROBES	Basque Country	Development of diagnostic strategies for high morbidity and mortality human diseases. Staph Scan (product): activatable contrast agent for fast and invasive detection of *Staphylococcus aureus.*
STEMTEK THERAPEUTICS	Basque Country	Research services in tumoural stem cells for the development of cancer treatment drugs.
SUR SEEDS	Andalusia	Project for Research Centre specialised in vegetable seeds.
Técnicas Analíticas de Galicia	Galicia	Food safety
ThreeRLabs	Basque Country	Organotypic cultures for drug and peptide screening for cancer therapy and other applications.
TOMAS CONTRERAS ROS	Andalusia	Specialised design for research applications and development of biotechnological dental implants.
Transplants Biomedical	Catalonia	Development of a new device for organ transportation available for hospital use.
UsMIMA	Catalonia	Development of a non-drug, non-invasive and side-effects free solution for chronic constipation in the form of a easy-use device that meets all quality and safety certifications of a class I medical device.
VIVEBIOTECH	Basque Country	Production factory of viral vectors for gene therapy.
xenOPAT	Catalonia	Mouse orthotopic models (orthoxenograft®) by implanting small pieces of human tumours in the appropriate organ of the animal.

Source: ASEBIO







3 Business activities

3. Business activities

Alliances and business development

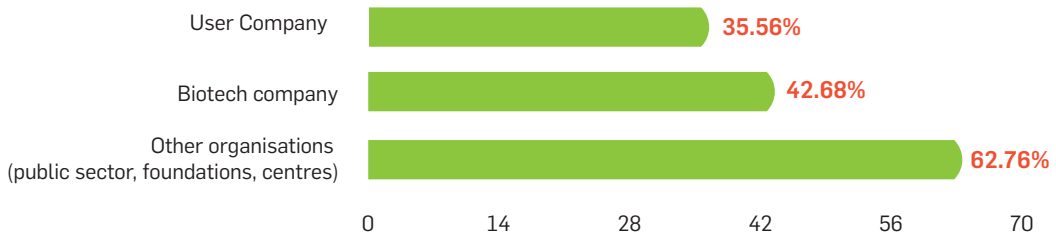
This section looks at business development by members of ASEBIO. It details alliances and/or collaborations such as co-marketing, co-development, and product or market exchanges agreed during 2014.

In 2014, a total of 239 agreements were signed. 42.68% of those (see Figure 10) involved another biotechnology entity, 35.56% involved a user company and 62.76% involved the participation of a public sector body, a foundation, or a technology centre

More than half of these business agreements were with Spanish entities (see Figure 11) while 27.2% were with European entities, 6.28% were with Asian entities and 5.44% with US entities.

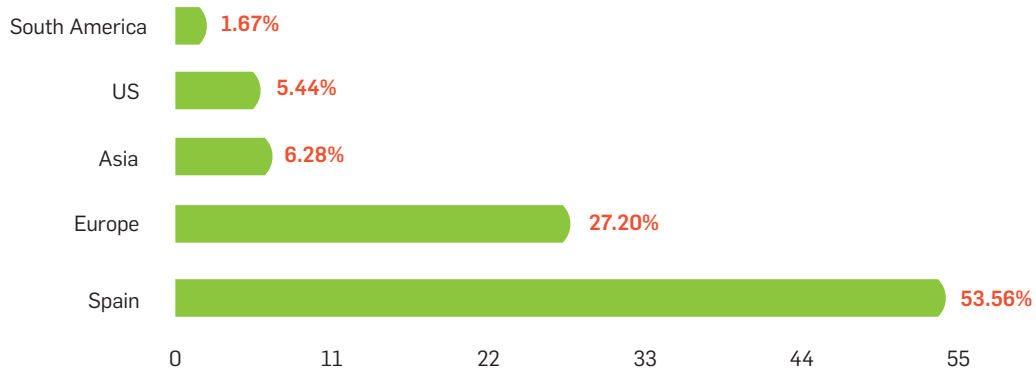
Figure 12 shows the main objectives of the collaborations. 49.79% were for R&D, 30.54% were marketing or distribution agreements, nearly 25% were for clinical development or field trials, just over 11% for production and 7.11% were regarding regulation or industrial protection.

Figure 10. Alliances in the Spanish biotechnology sector in 2014 by profile of partner



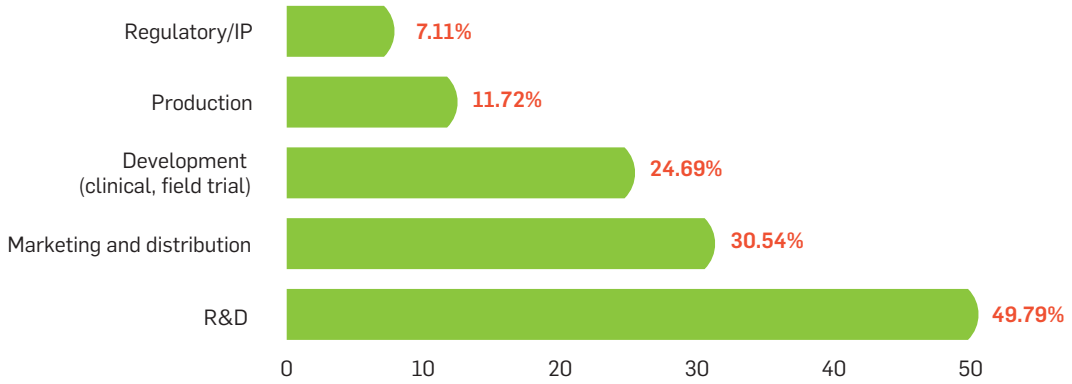
Source: ASEBIO

Figure 11. Alliances in the Spanish biotechnology sector in 2014 by global location of partner



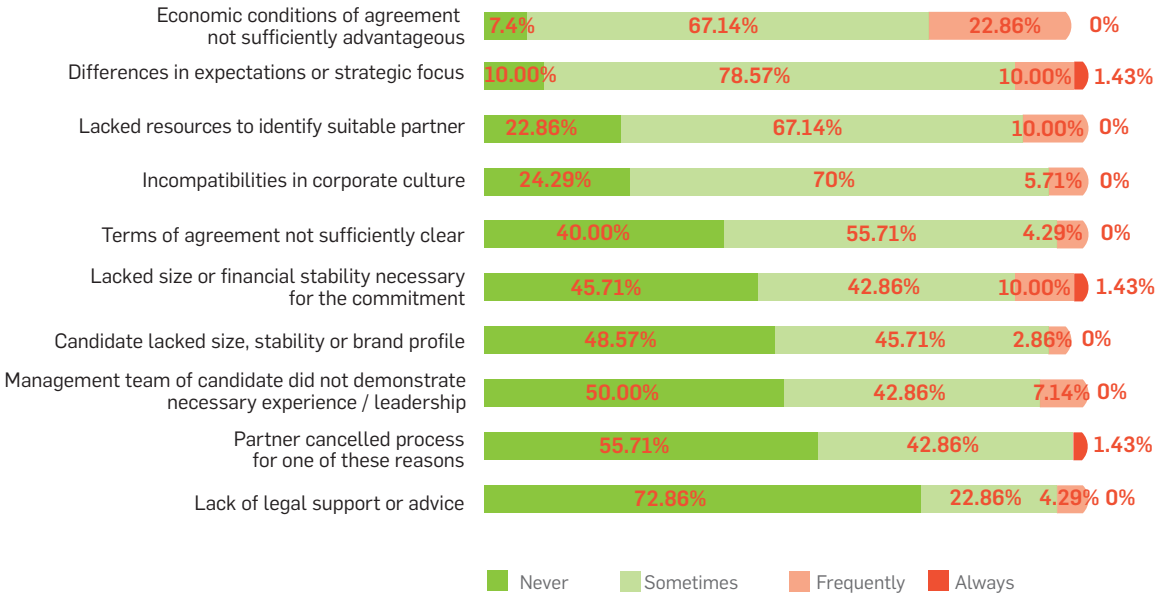
Source: ASEBIO

Figure 12. Alliances in the Spanish biotechnology sector in 2014 by objective of alliance



Source: ASEBIO

Figure 13. Barriers to forming alliances faced by those taking part in survey

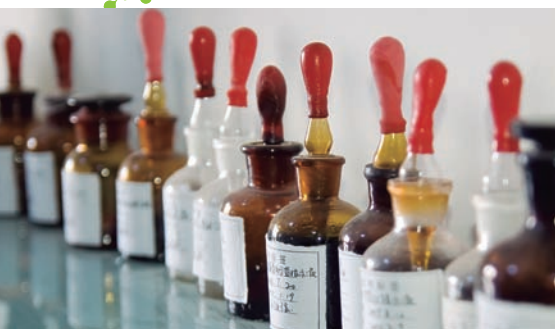


Source: ASEBIO

The results of the survey on the barriers our members have faced when attempting to form alliances are outlined in Figure 13.

As with the results of the survey for the 2013 ASEBIO report, 73% of respondents felt that they had never lacked legal support or advice, while almost 23% answered that they had sometimes faced this barrier and under 5% felt that they had frequently experienced a lack of legal support of advice.

Meanwhile, 22.86% of respondents have often found that the economic conditions were not advantageous enough to warrant an agreement. 67.14% found that this was sometimes the case while 7.14% never found this to have been the case.

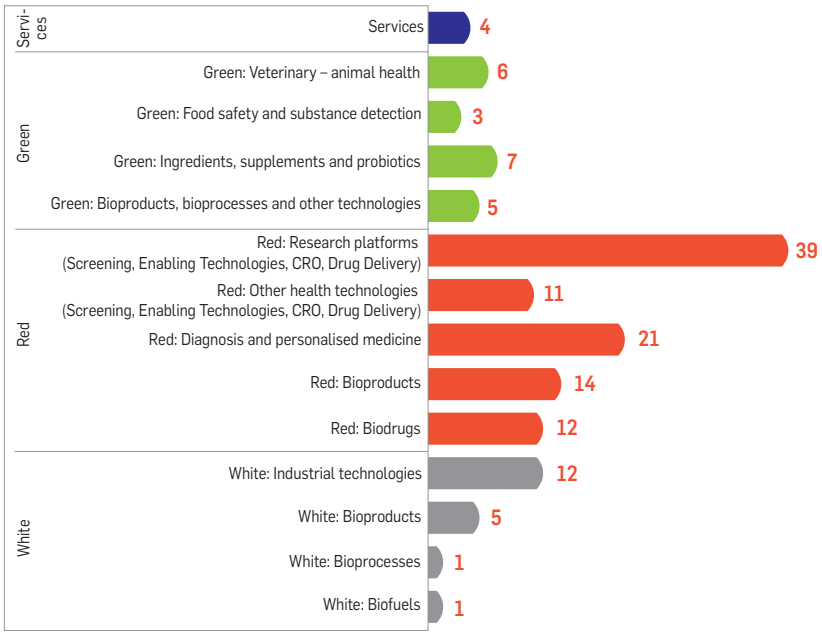


Product launches

A total of 141 product or services were launched to the market by members of ASEBIO during 2014. This marks an increase of 12% compared to product launches registered in 2013.

Table 4 provides a complete listing of all the products and services along with a description of each one.

Figure 14. Products and services launched to market by ASEBIO members



Source: ASEBIO

Table 4. Products and services launched to market by ASEBIO members

Company or entity	Product name and description
3P Biopharmaceuticals	Bioassay unit.
AGROCODE	NITROCODE RB+: *Rhizobium* biofertilizer.
AGROCODE	NITROCODE AZ+: *Azospirillum* biofertilizer
AGROCODE	MYCOGEL: only product on the market with sterile mycorrhiza in gel.
ALGAENERGY	PhycoAlgae®: is a phycobiliprotein obtained from *Spirulina platensis*. It has a high absorption capacity and an intense blue colour which makes it suitable for use as a dye due to its staining ability and antioxidant properties.
ALGAENERGY	AgriAlgae®: is an agricultural biostimulant based on amino acid hydrolysate from the *Spirulina* microalgae. It is 100% natural and contains high levels of free amino acids, polysaccharides, phytohormones, trace elements and antioxidants. Multiple applications and crop varieties.
Almirall	Blastouronic® is a cream formulated with specific ingredients: hyaluronic acid, BioEcolia, allantoin and glycerin. It acts as a post medical-aesthetic restorative treatment providing a soothing effect against the feeling of tightness and itching. With SFP30, it prevents hyperpigmentation and protects against ultraviolet rays.
Almirall	Blastofilm® liquid dressing, made from a cellulose derivative, which protects and effectively reduces the visibility of scars and the discomfort they entail, restoring and improving aesthetic appearance.
ArtinVet Innovative Therapies	Vexoderm: a next generation wound healing dressing that cleans and detoxifies the wound bed thanks to its moisturising and antioxidant properties.
Bioibérica	Oralvisc: Food Supplement to keep joints healthy in overweight individuals. Contains HA-Leptin (the combination of GAGs) and Vitamin C.
Bioibérica	Calmurofel: for the Feline Idiopathic Cystitis treatment. Made from chondroitin sulfate and glucosamine to help repair damage of the urinary bladder and restore levels of glycosaminoglycans. L-tryptophan reduces levels of stress and anxiety. Hyaluronic acid (ORALVISC ®) reduces the levels of leptin in the body and helps regulate excess weight.

Table 4. Products and services launched to market by ASEBIO members (cont.)

Company or entity	Product name and description
Bioibérica	Physicool: quickly decreases inf ammation and pain, which helps accelerate the recovery process. It is the only compressive bandage with a cold effect, combining cold, compression, and support. Physicool provides instant treatment for inf ammation and hematomas in muscles, tendons, and ligaments. Its effect lasts up to 2 hours, and needs no refrigeration. It is fully reusable.
Bioibérica	Duartron ®: hard gelatin capsules of glucosamine. For the treatment of osteoarthritis.
Bioibérica	Mobilee®: natural extract rich in hyaluronic acid, polysaccharides and collagen. A patented ingredient of unique composition, which has demonstrated that it improves joint mobility and muscle strength.
Biokit	Bioelisa HIV 1+2 Ag-Ab: fourth generation ELISA test for qualitative detection of antibodies to HIV-1, HIV-2 and HIV-1 p24 antigen in human serum or plasma. The product has two presentations: bioelisa HIV 1+2 Ag/Ab 96 tests and 480 tests.
Biokit	BIO-FLASH® Syphilis: a fully automated chemiluminescent two-step immunoassay for qualitative measurement of IgG and IgM antibodies to *Treponema pallidum* in human serum or plasma on the BIO-FLASH instrument.
Biokit	BIO-FLASH® CHAGAS assay: fully automated chemiluminescent two-step immunoassay kit for qualitative measurement of antibodies IgG and IgM to *Trypanosoma cruzi* in human serum or plasma for the diagnosis of Chagas disease on the BIO-FLASH instrument.
Biomedal	GlutenTox Pro Surface Kit: To detect the presence of gluten on surfaces.
Biomedal	AlerTox Sticks Fish Kit: to detect the presence of fish allergenic proteins in food, beverages and surfaces.
Biomedal	iVYLISA GIP: to detect the accidental consumption of gluten by celiac patients or if the patient is not following the recommendations of the specialist.
BIONET INGENIERIA	Startup of downstream development laboratory.
BIOSEARCH	PF1®: medical device for controlling the type IIb cholesterol. Carob extract, high in nonhydrolyzable condensed tannins obtained by aqueous extraction system without using ethanol or organic solvents.
Biotech Development	BioSeed Capital: new consulting service specialising in fundraising and business development of biotechnology-based companies.
Camelina Company España	Nationwide camelina seed production for the production of sustainable biofuel feedstock.
Canvax Biotech	Cell based assays: assays for apoptosis, proliferation, cytotoxicity, SEAP, Beta-galactosidase, senescence, oxidative stress, etc.
Canvax Biotech	Buffers & Reactivos: EDTA, PBS, SDS, Tris-HCl, TBE, TE, etc. Buffers and Reagents: EDTA, PBS, SDS, Tris-HCl, TBE, TE, etc.
Canvax Biotech	CANFAST: transfection reagent.
Canvax Biotech	pOnebyOne®: expression vector of two mammalian cell proteins based on a 2A sequence.
Canvax Biotech	PickMutant®: directed mutagenesis kit.
Celgene	ABRAXANE® (paclitaxel albumin-bound particles for injectable suspension). Consensus to improve the treatment of pancreatic cancer developed by experts from the digestive tumors group.
Celgene	Pethema: Gelthamo Spanish group of doctors. Linked to hematology research. Collaborations in research meetings.
CIBERER	CIBERER Exome Server: free online tool designed to help Spanish researchers to substantially improve filtering potential of pathogenic genetic variants.
CIRCE Crystal Enginnering	CIRCE Ultrafast Virtual Screening (cUFVS): Software-based solution that compares millions of structures based on shape and electric charge.
Cytognos	Fixative-free erithrocyte lysing solution recommended for the osmotic lysis of the erithrocytes before immunof uorescence staining of peripheral blood or bone marrow aspirate samples.
Cytognos	ß2-microglobulin PerCP-Cyanine5.5 (antibody for human antigens).

Table 4. Products and services launched to market by ASEBIO members (cont.)

Company or entity	Product name and description
Cytognos	ROR-1 APC (antiboby for human antigens).
Cytognos	CD138 PacificBlue (antiboby for human antigens).
Cytognos	CD134 PE (antiboby for human antigens).
Cytognos	CD64 APC (antiboby for human antigens).
Cytognos	CD45 PerCP-Cyanine5.5 (antiboby for human antigens).
Cytognos	CD34 PerCP-Cyanine5.5 (antiboby for human antigens).
Cytognos	CD25 APC (antiboby for human antigens).
Cytognos	CD3 PerCP-Cyanine5.5 (antiboby for human antigens).
DREAMgenics	ONCOgenics: family of panels for the diagnosis of somatic and hereditary cancer. ONCOgenics Easy, ONCOgenics Germline y ONCOgenics Exome.
DREAMgenics	HD Genome One Research Edition: software for automated analysis of genomic data from NGS technologies.
DuPont Pioneer España	Launch of 20 new corn and sunf ower hybrids: high yield hybrids, innovative nutritional profiles for human consumption and animal feed. Adaptation to unfavourable abiotic conditions, and tolerant to pests, diseases and herbicides.
Enzymlogic	Binding Mechanism Profiling: to determine the binding mechanism of developing drugs against their targets. Assists in the identification of drugs with non-classical mechanisms that are an alternative to the development of resistance or in unresponsive patients to conventional therapies.
Enzymlogic	Kinetic Selectivity Profiling: off-target interactions: to characterize the kinetic profile against secondary targets assisting in the advancement of safer drugs. Also helps identify new therapeutic uses.
Enzymlogic	Binding Kinetic Profiling: drug-target interaction: to determine the time a drug remains bound to its target and association constants, dissociation and affinity simultaneously.
Era7 Bioinformatics	Genome7: High quality, integrated interactive web applications with user-friendly access to the best databases of the Genomics of Cancer data Service
Era7 Bioinformatics	CG7: f exible, comprehensive and complete comparative genomics service for bacteria.
Esteve	Oftaclean MED: eye wipes for daily cleaning.
Esteve	Oftaclean: eye wipes for daily cleaning.
Esteve	Repel Bite Xtreme: insect repellent.
Esteve	Afterbite Gel Xtreme: relief from the discomfort caused by skin contact with insects, irritating plants or marine animals.
Esteve	Yantil Retard: treatment of severe chronic pain in adults that can only be adequately managed with an opioid painkiller.
Esteve	Laxadina: natural laxative plant based drug for the treatment of occasional constipation.
Ferrer	TRINOMIA: substitution therapy in adult patients adequately controlled with the three substances (acetylsalicylic acid, atorvastatin and ramipril) taken at the same time at equivalent doses, to minimise the risk of having a cardiovascular accident in patients who have already suffered a previous cardiovascular event.
Ferrer	ADASUVE: inhalation powder for the rapid treatment of slight to moderate agitation associated with schizophrenia or bipolar disorder in adults.
FRIAL in collaboration with the Hospital IdiPAZ-Madrid (Research in Nutrition and Functional Foods (Nutrinvest))	Line of low-fat and rich in omega-3 cold cuts (meats) that have been shown to improve antioxidant activity and inf ammation parameters.
GENETADI	FERTITEST: new genomic tools to support medical specialist assisting couples with fertility problems.
GENOMICA	CLART HPV4: kit for detection and genotyping of 35 types of human papillomavirus (HPV).

Table 4. Products and services launched to market by ASEBIO members (cont.)

Company or entity	Product name and description
GENOMICA	CLART CMA EGFR: kit for detecting mutations of genes involved in responses to antitumor therapy with monoclonal antibodies.
GENOMICA	CLART CMA NRAS·iKRAS: kit for detecting mutations of genes involved in responses to antitumor therapy with monoclonal antibodies.
Genzyme	AUBAGIO ®: new oral first-line treatment for the treatment of relapsing-remitting multiple sclerosis (RRMS).
Gilead Sciences	Sovaldi: for use in combination with other drugs for the treatment of chronic hepatitis C in adults.
Glen Biotech	Phoemyc: product for strengthening defences in palm trees.
Grifols Engineering	Monoblock: dispenser of clinical diagnosis reagents.
Grifols Engineering	New device for the automated recapping of sample tubes.
Health in Code	Ultra sequencing services HiSeq 1500 sequencer (Illumina).
Health in Code	Genetic diagnosis for inherited cardiovascular disease.
IMEGEN	Ad Hoc Exome: diagnostic panels based on Clinic Exoma.
Indra in consortium with Althia and Lorgen	Tradion P: Smart prototype to help personalise cancer treatments.
Ingenasa	INgene q PPA: Real time PCR assay for detection of ASFV in biological samples.
Ingenasa	INgeChip Alergias Caninas: detection and quantification service of allergen-specific IgE in canine serum samples.
Ingenasa	INgezim IBR gE: ELISA kit for the detection of specific antibodies to IBRV gE protein in bovine serum samples.
Ingenasa	INgezim PRRS 2.0: ELISA kit for the detection / quantification of specific antibodies against PRRSV in porcine serum.
Ingeniatrics Tecnologias	Platform for stability studies with humidity and temperature control.
Ingeniatrics Tecnologias	Manufacture of food grade particles.
Intelligent Pharma	Pythia: software for in silico discovery of action mechanisms of small molecules.
Intelligent Pharma	Phythia: virtual polypharmacy tool that, when given the formula of a drug-in-development, estimates within seconds which body proteins it interacts with and therefore, what diseases it may be useful for.
Iproteos	IPRO technology: platform for the discovery and development of peptidomimetics capable of interrupting and / or modulating protein-protein or protein-ligand interactions.
IQS	Application for the virtual design of new biocatalysts for the production of compounds with high added value.
LEITAT	Ready-to-use conveyors kit launch (BRCP and OATP2B1 / BCRP) for xenobiotic interaction studies and active transport of drugs.
Merck	Eeva (Early Embryo Viability Assessment): new technology for the early, objective and non-invasive identification of the most suitable embryos for transfer to the uterus, increasing the chance of successful treatment.
MSD	COSOPT PF 20mg/ml + 5mg/ml: eye drop solution in single-dose container. Treatment of elevated intraocular pressure (IOP) in glaucoma patients. Presented in a dose container without preservatives.
MSD	Simponi 50mg y 100mg: expanding of its use in the treatment of ulcerative colitis.
Myriad Genetics	myPath: diagnostic test to distinguish malignant melanoma from benign pigmented skin lesions with great precision.
Myriad Genetics	Myriad myPath Melanoma: test to diagnose malignant melanoma.
Myriad Genetics	myRisk: the first multigene test which analyses 25 genes associated with the eight most common types of cancer: breast, ovary, endometrium, pancreas, colon, prostate, gastric and melanoma.

Table 4. Products and services launched to market by ASEBIO members (cont.)

Company or entity	Product name and description
Myriad Genetics	Molecular test which accurately differentiates malignant melanoma from benign skin lesions and helps dermatologists to provide a more objective and safer diagnosis for patients.
Myriad Genetics	TBRCA test launch for the analysis of BRCA1 and BRCA2 genes in tumour tissue associated with Lynparza treatment for ovarian cancer.
Nanoimmunotech	NITBIOCONJUGATION: custom biosensor platform development service.
Nanoimmunotech	NITBIOCONJUGATION: custom bioconjugation services.
Nanoimmunotech	LinkOriented kit: proteins-nanoparticles bioconjugation kits (NITBIOCONJUGATION).
Nanoimmunotech	NITmagold: glod-coated magnetic nanoparticle line (NITPARTICLES).
Nanoimmunotech	NITgold Lipoic: lipoic acid-coated gold nanoparticle line (NITPARTICLES).
Nanoimmunotech	NITgold COOH-PEG: COOH-PEG-coated gold nanoparticle line (NITPARTICLES).
Nanoimmunotech	NITgold Cit: citrate-coated gold nanoparticle line (NITPARTICLES).
Nanoimmunotech	HEATSENS: innovative thermal biosensor technology (NITBIOSENSING).
Nanoimmunotech	NITgold clusters: gold Nanocluster line (NITPARTICLES).
NanoMyP	Tiss®-ENV: are fibre tissues with a pre-activated surface which can remove heavy metal from aqueous media (decontamination processes).
NanoMyP	Tiss®-Metal are fibre tissues doped with plain metal nanoparticles of Silver (Tiss®-Metal-Ag) or Gold (Tiss®-Metal- Au).
NanoMyP	Tiss®-NH2 is a family of fibre tissues made by electrospinning with a very high specific surface. Tiss®-NH2 are produced with different concentrations of –NH2 groups and a high degree of biocompatibility, which is important for decreasing background in biological assays and in preventing denaturation on immobilised biomolecules.
NanoMyP	Tiss®-Streptavidin is a revolutionary family of fibre tissues made by electrospinning with a very high specific surface and loaded with a high amount of covalently attached streptavidin.
Neol	Neoleum™: an extremely oil productive microorganism obtained from the processing of organic or industrial waste.
Neuron BioServices	New consulting service for the design and implementation of research laboratories and animal facilities.
Neuron BioServices	New method for measuring neurite outgrowth in differentiated cells to study of the effect of samples on neural plasticity problems.
Neuron BioServices	New service to create genetic tools and transgenic animals.
Neuron BioServices	*In vitro* system to test the ability of novel compounds or ingredients to cross the blood brain barrier (BBB).
NorayBio	MSI Analyst: new software for tissue image analysis.
OPERON	CT OligoGen: test designed for the detection of Chlamydia trachomatis by simultaneous amplification of two independent DNA targets: one in the cryptic plasmid and one in the genome itself and subsequent identification by immunochromatography. This test can detect infections caused by the wild-type CT, the Swedish variant or those which do not carry the cryptic plasmid.
OPERON	HSV ½ OligoGen: test designed for the detection and differentiation of Herpes simplex type 1 and 2, by a common virus amplification and subsequent identification of two different immunochromatographic strips.
OPERON	NG Oligogen: test designed for the detection of *Neisseria gonorrhoeae* by simultaneous amplification of two independent DNA targets and subsequent identification in immunochromatographic strip.
OWL Metabolomics	OWLiver Care: Diagnostic screening system identifies sufferers of fatty liver in a normal population.
Phyture Biotech	Arabian Cotton Stem Cells: active cosmetic ingredient for photoprotection and photo-ageing.
Plebiotic	Molecular Dynamics platform for drug discovery: analysis of mechanisms of action and an additional Plebiotic software for the design of antibodies.

Table 4. Products and services launched to market by ASEBIO members (cont.)

Company or entity	Product name and description
Progenika Biopharma	BIDS XT: software for analysis and reporting of blood genotyping with CE marking
Progenika Biopharma	ID HPA XT: genotyping kit of human platelet antigens with CE marking.
Progenika Biopharma	ID CORE XT: blood genotyping kit with CE marking from notified body.
Promega Biotech Ibérica	HDAC-Glo™ Class IIa and HDAC-Glo™ 2 Assays: homogeneous and luminescent assays that measure the relative activity of histone deacetylase (HDAC) Class IIa and Class I enzyme 2, respectively, from cells, extracts or purified enzyme sources.
Promega Biotech Ibérica	CellTiter-Glo® 3D Cell Viability Assay: homogeneous method to determine the number of viable cells in 3D cell culture based on quantitation of the ATP present.
Promega Biotech Ibérica	RealTime-Glo™ MT Cell Viability Assay: non-lytic, homogeneous, bioluminescent method to determine in real time the number of viable cells in culture by measuring the reducing potential of cells and thus metabolism.
Promega Biotech Ibérica	PowerPlex® Fusion 6C System: six-channel multiplex system for 27 human loci detection by f uorescent methods used for identification in forensic analysis.
Promega Biotech Ibérica	Maxwell® Rapid Sample Concentrator (RSC): automated platform based on the use of paramagnetic particles for the purification of nucleic acids from a wide range of samples. The system processes up to 16 samples simultaneously.
Promega Biotech Ibérica	Eight tubes Strips to easily determine kinase profiles based on ADP-Glo ™ Kinase Selectivity Profiling Systems technology.
Proteos Biotech	PBSERUM EXTREME FIRMNESS COMPLEX: professional facial firming treatment.
Proteos Biotech	PBS SMOOTH OUT POWER/PBS DRAINING POWER: enzymatic treatments for fibrous and edematous cellulite.
Reig Jofre Group	Nife-Par: management of preterm labour.
Sanofi Pasteur MSD	Zostavax® is the first and only vaccine for the prevention of herpes zoster (HZ) and post-herpetic neuralgia.
Secugen	NGS diagnosis of atypical hemolytic uremic syndrome.
Sistemas Genómicos	Kits SG: It provides kits for research of the main genetic mutations known in the fields of breast cancer, hereditary cancer, cardiology, neurology, otolaryngology, musculoskeletal and pharmacogenetics.
Sistemas Genómicos	SGPlataforma GeneSystems: a new solution to support research and clinical diagnosis based on genetic data. User-friendly interfaces with ability to detect and prioritise variants of a candidate, aid for early diagnosis, filtering systems and availability of the hosting data results with Cloud Computing.
Sistemas Genómicos	BabyTest y RhTest: genetic test that detects fetal sex and maternal blood Rh with high reliability.
Stem Center	Tissue processing platform for plastic surgery.
StemTek Therapeutics	Services of drug screening/discovery/validation of cancer stem cells.
Sygnis Biotech	TruePrime™ Single Cell WGA: method to achieve accurate genome amplification from a single cell to incorporate a revolutionary technology for whole genome amplification. TruePrime™ Single Cell WGA kit based on the combination of the DNA primase "TthPrimPol" and the Phi29 DNA polymerase.
Vaxdyn	Research service for the repositioning of approved antibiotics or those in late-stage development.
Vivia Biotech	Personalised medicine test for acute myeloid leukemia.
Zurko Research	Evaluation of the SPF resistance to water, sweat and sand.
Zurko Research	Services for Medical Devices, studios and production records for CE marking, ISO 13485, health Licenses and MD Production.

Source: ASEBIO

Strategic priorities

This section looks at our members' priorities for 2015 and compares them to the priorities for 2014.

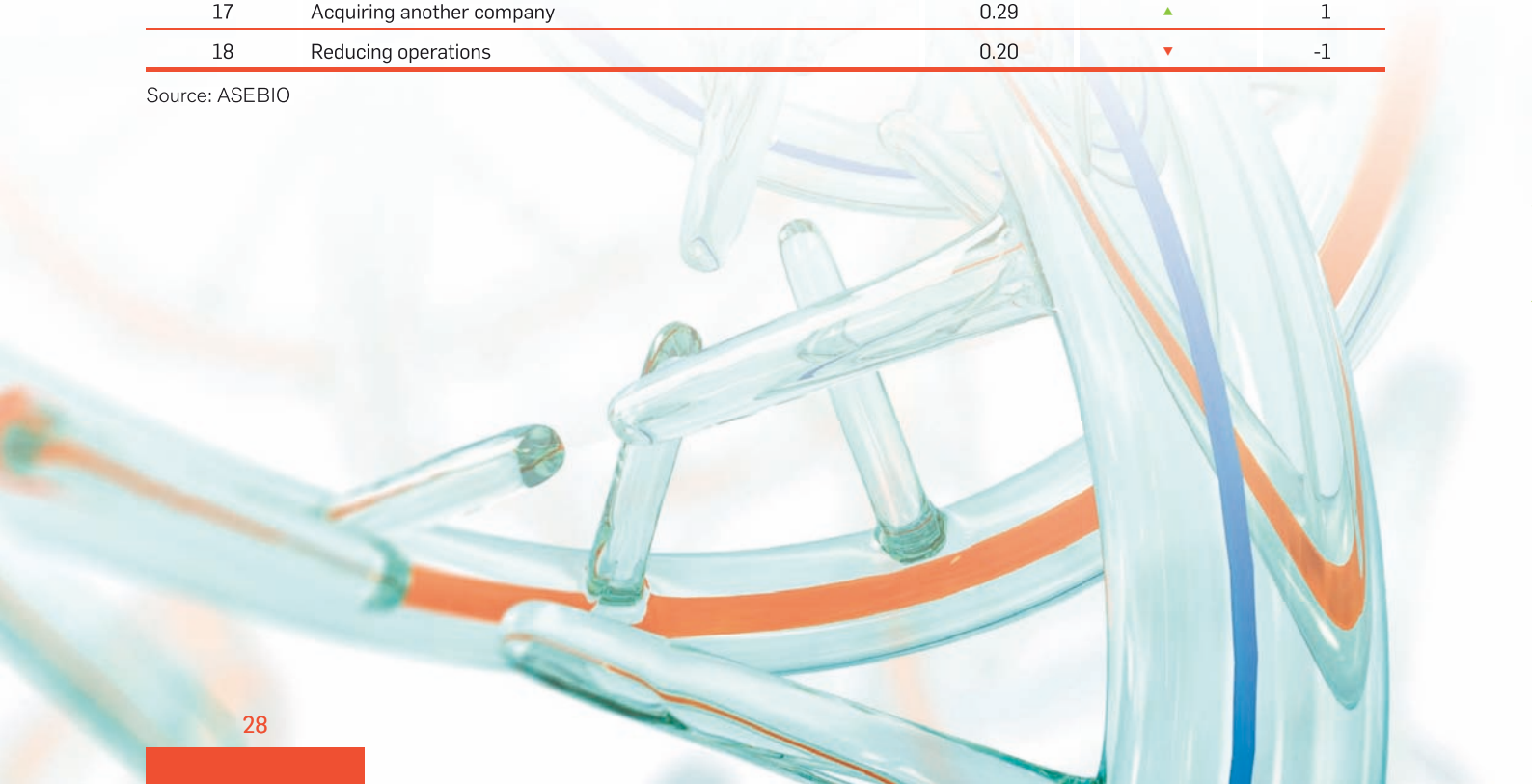
Internationalisation is still the number one priority for ASEBIO members. The second most important priority is generating alliances with biotechnology user companies, such as pharmaceuticals or food sector companies, which means that in 2015 it is a bigger priority than it previously was.

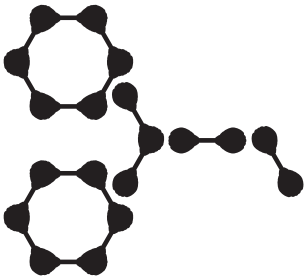
At the other end of the scale are acquisitions and operational reductions, as the lowest priorities. The biggest changes compared to 2014 are the greater prioritisation of alliances with other biotechs, which climb three places, and setting up joint ventures, which has dropped four positions.

Table 5. Strategic priorities for Spanish biotechnology companies

Position 2015	PRIORITY	Relevance in 2015	Change from 2014	
1	Internationalisation	2.90	/=/	0
2	Alliances with user companies	2.52	▲	2
3	Launch of products to market	2.41	▼	-1
4	Acquiring knowledge and/or technology	2.41	▼	-1
5	Alliances with other biotechs	2.09	▲	3
6	Enter into clinical phases / field trials / dose scaling	2.08	▼	-1
7	Contracts or alliances with public institutions	1.91	▼	-1
8	Expanding into other business areas	1.81	▲	1
9	*Licensing out* technology	1.70	▼	-2
10	Refocusing product development	1.09	▲	2
11	*Licensing in* technology	1.05	▲	2
12	Refocusing R&D activities	0.95	▼	-1
13	Hiring overseas professionals	0.89	▲	1
14	*Joint venture* agreements	0.79	▼	-4
15	Outsourcing production	0.55	/=/	0
16	Merging with another company	0.35	/=/	0
17	Acquiring another company	0.29	▲	1
18	Reducing operations	0.20	▼	-1

Source: ASEBIO





4

Industrial property rights and knowledge generation

4. Industrial property rights and knowledge generation

The data in the following Technology Watch Report was obtained using the method designed by Clarke, Modet & Cº and Madrid Science Park based on the OECD definitions for the biotechnology sector. Our methodology continuously incorporates improvements based the experience gained during previous studies on Industrial Property Rights conducted in recent years.

This report was compiled using data sourced from Thomson Reuters databases.

Other public databases used for data contrasting purposes include those of: the Spanish Trademark and Patent Office (SPTO), the European Patent Office (EPO), the United States Patent and Trademark Office (USPTO), Japan Patent Office (JPO) and the World Intellectual Property Organization (WIPO). All of them are freely accessible and, as statistics are based on patent publications, downloading the full documents referenced is also free in almost all cases.

Patent applications published and patents granted

There were 976 biotechnology sector patents published in Spain via the PCT (results for search of published patents for bio sector, Spanish, PCT, EP, US and JP, prioritising Spanish or Spanish agent and Spanish client), which is an increase of 8% over 2013, a positive figure compared to 2013, which saw a drop of 15.32% compared to 2012.

65% of patents published were patent applications, while the other 35% was for patents granted. Table 6 shows the breakdown according to the extent of protection obtained (whether the patents are Spanish, European, US, Japanese, or international). The SPTO column shows applications and patents granted for Spain; the EPO column shows European applications and patents granted; the USPTO column shows applications and patents granted for the US; JPTO shows applications and patents granted for Japan and, lastly, PCT shows applications submitted via the PCT system.

Figure 15 shows that the biggest proportion of published applications went through the PCT, which accounts for 33% of the total, this is followed by applications to SPTO and EPO, with 27% each. The distribution is practically the same as in 2013.

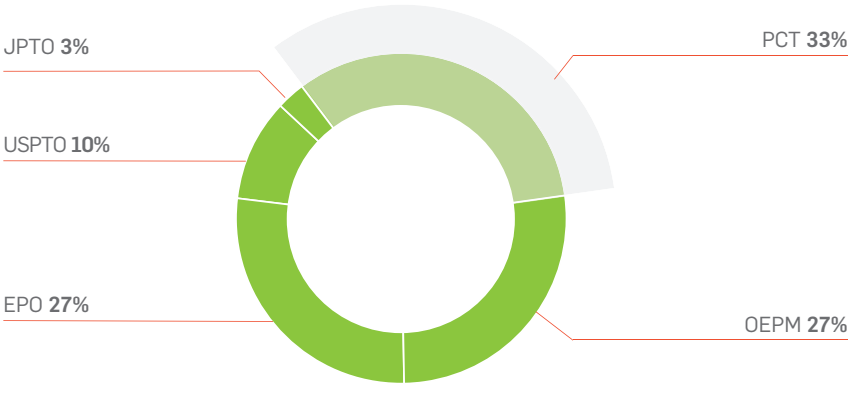
Figure 16 shows that the greatest proportion of patents granted is still processed by the USPTO, with 57% of the total.

Table 6. Patent applications and patent granted for Spanish biotechnology entities (2014)

Patentes publicadas 2014	OEPM	EPO	USPTO	JPTO	PCT	TOTAL
Applications	174	172	63	20	207	636
Granted	195	78	47	20	0	340
TOTAL	369	250	110	40	207	976

Source: Clarke & Modet - PCM.

Figure 15. Patent applications (2014)



Source: Clarke & Modet-PCM

Compared to 2013, there has been a particular increase in the number of European patents granted, from 14% up to 23% in 2014. The number of Spanish patents granted has experienced a slight fall, from 68% in 2013 to 57% in 2014 - possibly a consequence of the drop in patent applications seen the previous year.

Patent ownership in 2014

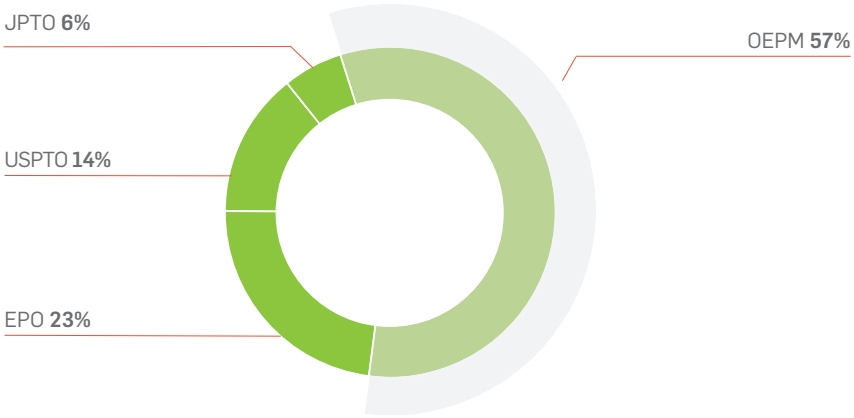
The business sector was the main actor in Spain during 2014, accounting for 30% of published patents, followed by co-owned patents, at 26% of the total, and universities, with 21%. Both the number of applications and the number of patents granted reflect this trend in ownership (see Figure 17).

Company patents in 2014

Over 2014, the activities of 160 biotechnology companies accounted for 290 applications and patents granted. In 2013, the same number of applications and patents (290) were attributed to a total of 142 businesses.

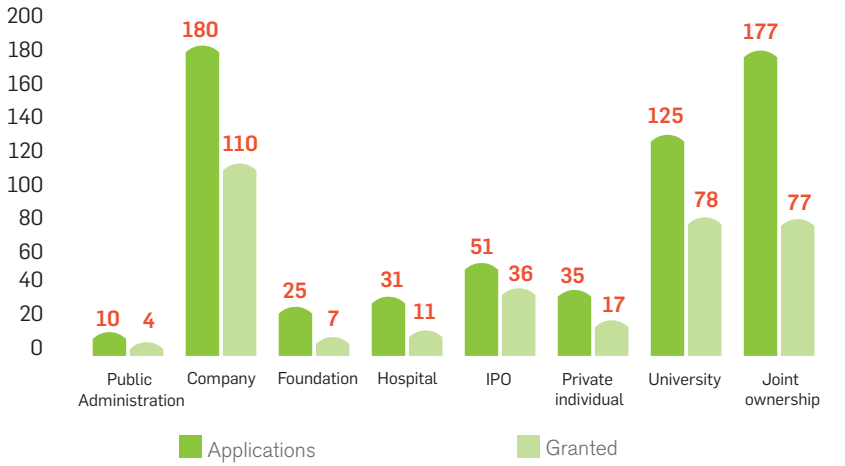
Lipotec and Grifols were, as was also the case in 2013, the two most prolific companies for patent publications. Lipotec published the most, with nine applications and another nine patents granted, followed by Grifols which published 11 patent applications and had two patents granted. Bioibéirca and Dr. Healthcare came next, with six patent publications each.

Figure 16. Patents granted (2014)



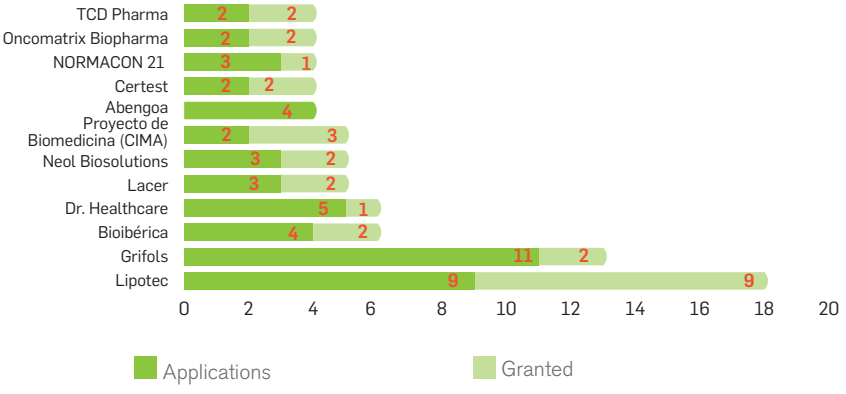
Source: Clarke & Modet - PCM

Figure 17. Ownership of patent applications and patents granted (2014)



Source: Clarke & Modet – PCM

Figure 18. Companies filing patent applications and patents granted (2014).



Source: Clarke & Modet - PCM

Industrial property in the Spanish biotechnology sector: 2009-2014

According to the data published over the last six years, the number of patents emerging from the biotechnology sector is clearly on an upward trend, with an increase of 126.98% over 2009-2014. This evolution reflects the strong growth of the sector, while also underscoring the importance of industrial property as a source of returns on investments. The growth in patents is stronger than last year and a positive contrast, particularly as in 2013 growth fell quite sharply. There has also been a generalised increase in the number of patents published during 2013-2014, marking a break from the trend of the previous period.

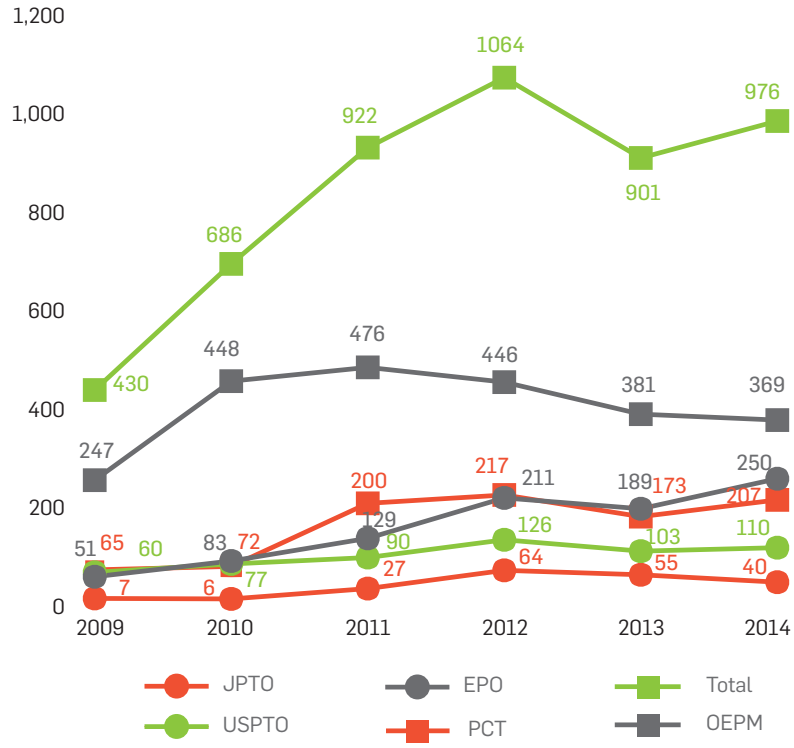
Considering year-on-year variations, there has been a clear acceleration in patent publications globally over the 2014-2013 period, with a growth of 8.32%, meaning a break from the previous trend over the 2013-2012 period, although still falling short of the numbers obtained during previous periods. There is also a positive trend in the number of applications, with an increase of 11.58% over 2014-2013, which contrasts to the 25.97% fall during the previous period.

The growth in patents granted is also 2.72% lower than during 2012-2013, when it rose by the record figure of 12.59%

The trend analysis shows the evolution of each application process over recent years.

Figure 19 shows the evolution of biotechnology sector patents published in Spain. It reflects the increase in the total number of publications over 2014, particularly in comparison to 2013 when, in a change of trend from previous years, the fall became quite sharp. Although the overall number has now recovered, the current data is still a long way from the trend seen until 2012.

Figure 19. Trends in published patent applications. 2009-2014



Source: Clarke & Modet-PCM

Scientific production - biotechnology companies

Every year, ASEBIO carries out a study of publications in high impact journals by Spanish biotechnology companies and international research laboratories based in Spain that are members of ASEBIO.

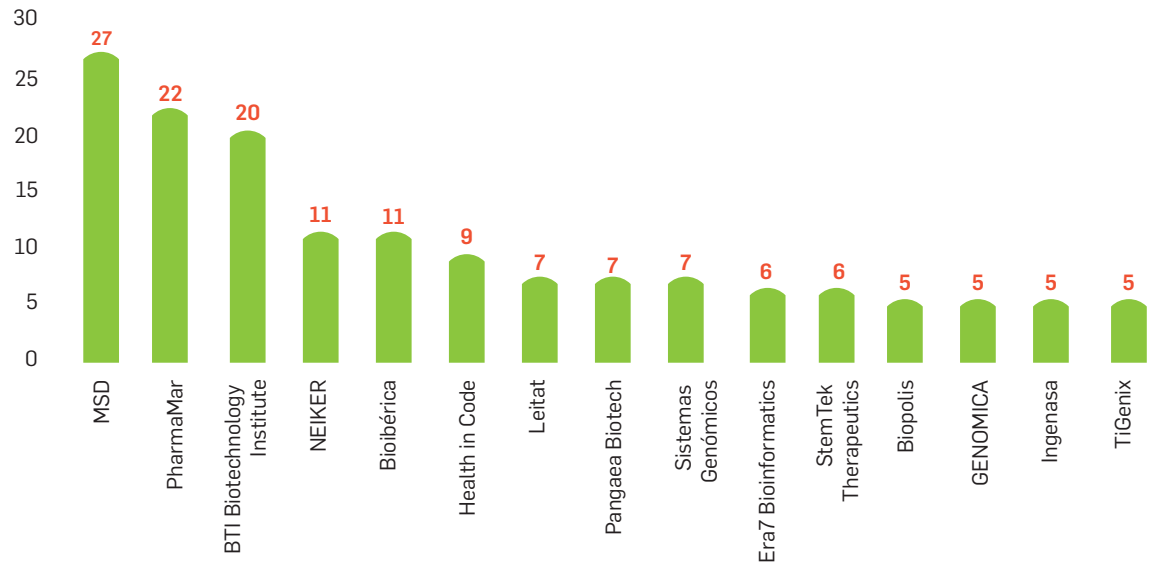
The study does not include press releases, conference posters, poster presentations, or publications by research centres or universities which do not mention a relationship to business projects.

Over 2014, biotechnology firms have published 215 papers. A total of 44 biotechnology firms were responsible for those publications.

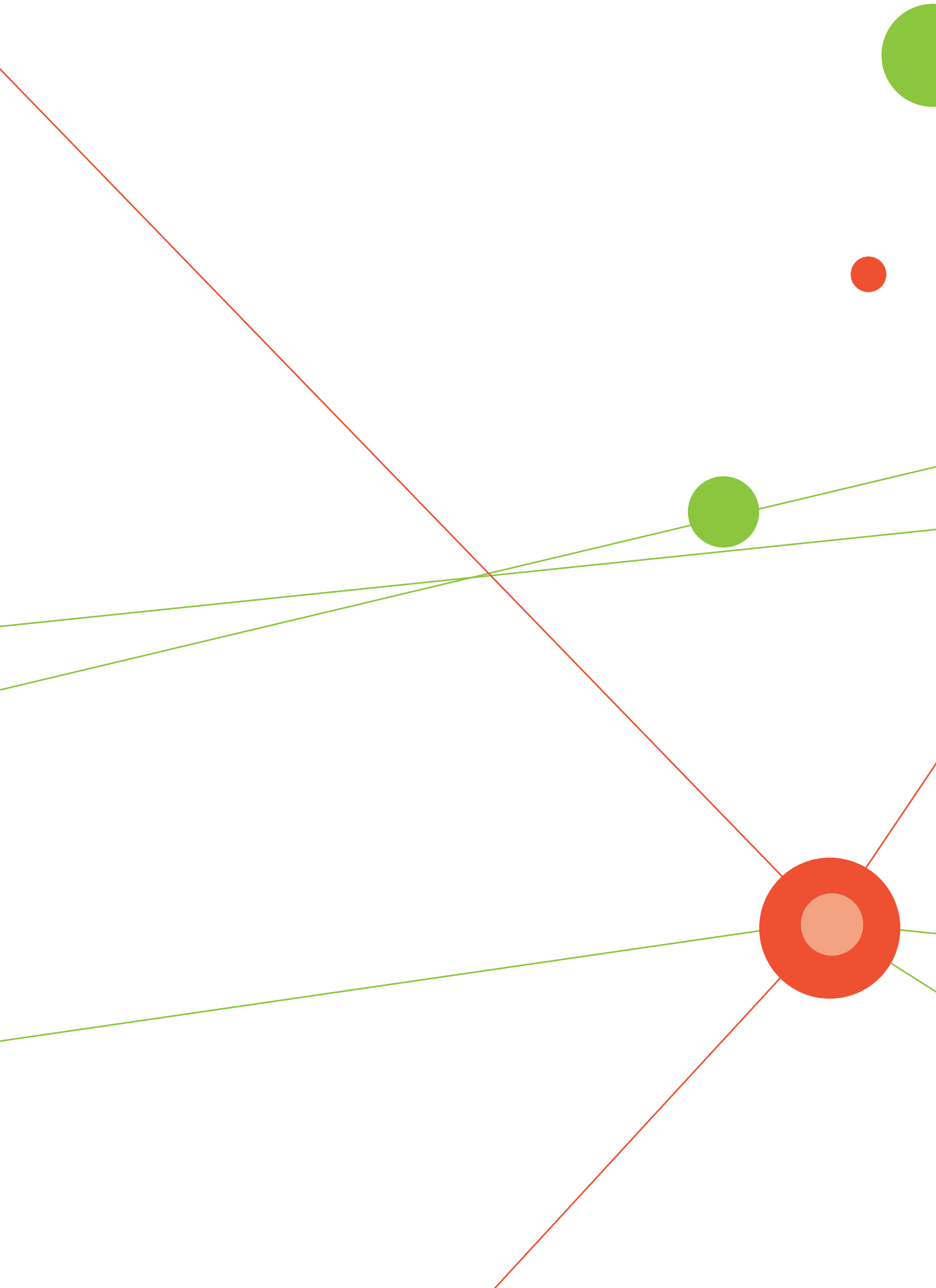
The companies which have published most prolifically (see Figure 20) are MSD, with 27 publications, followed by PharmaMar with 22, which in turn is closely followed by BTI with 20 publications. The next group includes Neiker and Bioibérica with 11 publications each, Health in Code with nine, and Leitat, Pangaea Biotech and Sistemas Genómicos contributed seven publications each.

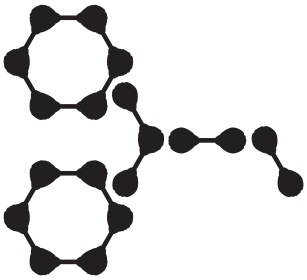
Even though they are not officially included in this analysis because they are not companies, it is still interesting to note that IQS published 23 scientific publications, while the MEDINA Foundation published 14, the Grupo Biofarma from Santiago de Compostela University published seven and INBIOMED Foundation contributed two scientific publications.

Figure 20. Number of scientific publications by ASEBIO member companies



Source: ASEBIO





5

Health – Red biotechnology

5. Health – Red biotechnology

Health biotechnology improves patient's quality of life of patients everyday, making it possible to live healthier lifestyles and make better medical decisions, making diagnosis more reliable and providing easier access to therapeutic solutions tailored to the individual necessities of patients. This area of biotechnology is essential for the discovery of new drugs to deal with unsolved medical issues.

In April 2014 the most important collaboration agreement in Spanish Biotechnology to date took place – a collaborative project between multinational pharmaceutical company Roche and Spanish biotechnology company Oryzon Genomics, for the development of drugs based on epigenetics. This collaboration will lead to R&D and commercialisation of Lysine (K)-specific demethylase (LSD1;KDMA1A) inhibitor, an epigenetic modulator that regulates the LSD1 gene expression in oncology, haematology and other diseases.

Through this agreement, **Oryzon** will receive around 21 million dollars as a down payment and a short-term clinical milestone. **Oryzon** will subsequently receive payments for project milestones for the **clinical** and commercial development of Haematology, Cancer and Benign Indicators that could exceed 500 million dollars.

This is a list of the most important projects and developments in Health Biotechnology by Spanish ASEBIO members.

Molecular diagnosis and personalised medicine

Spain is building a new market for personalised medicine. There are numerous new projects in this field as well as a growing number of investors interested in the field.

Neuron Bio has developed a tool for diagnosing Alzheimer's in its early stages – mild cognitive impairment (MCI) – by identifying the biomarkers found in peripheral fluids that could be extracted from buccal swabs, such as blood, saliva, or gingival crevicular fluid. This newly patented method substantially improves the current cerebrospinal fluid measuring techniques and ensures we are not using more complex and harmful techniques.

Myriad Genetics launched myPath, a test to accurately differentiate malignant melanomas from benign pigmented skin lesions. Myriad Genetics also reached an agreement to commercialise EndoPredict exclusively in Spain and Europe. This is the first second-generation multi-gene test for patients with breast cancer. The company also launched MiRisk in Spain, a multi-gene test that examines 25 genes associated with eight of the most frequent types of cancer: breast, ovary, endometrium, pancreas, prostrate, stomach and melanoma.

Myriad Genetics has also submitted the first part of the application for approval of drug use and commercialisation to the FDA (US Food and Drug Administration) for its BRACAnalysis diagnosis test for use with Olaparib, a poly (ADP-ribose) polymerase (PARP) inhibitor. It is an innovative, oral drug, potentially the first drug in its group.

Nanoimmunotech has developed an innovative ultra-sensitive biosensor technology to detect proteins. This new technology could, for example, lead to the early detection of human diseases.

The Sant Creu i Sant Pau Hospital (Barcelona) and **Sistemas Genómicos** have together designed OncoPharma Geneprofile®, a 136-gene panel (test) to help cancer patients choose the best treatment for their condition.

Development of therapies for human health

Over recent decades biotechnology has facilitated the development of more than 650 innovative biological drugs that have been used to treat diseases such as cancer and other severe conditions such as neurological, rheumatic and endocrinal diseases. Within the next few years, a large percentage of the drugs that come to market will be biological drugs, catering to the needs of patients that currently do not have an adequate treatment.

In order to shed light on the complexity of these new drugs, ASEBIO has released a position paper with a focus on the specific characteristics of these drugs that clearly are the present and future of a new and promising era of pharmacological therapies that will change the lives of millions of people around the world.

The following pages cover some of the work carried out by biotechnology entities in this area.

Oncology

Ability Pharmaceuticals carried out clinical studies and began to administer the ABTL0812 drug to patients with lung and pancreatic cancer. This drug inhibits the proliferation of tumour cells using a new mechanism of action. The molecule has demonstrated great efficacy and safety during pre-clinical studies. ABTL0812 will be administered orally once a day.

MSD has signed agreements with Pfizer, Incyte and Amgen to collaborate clinically in projects for the treatment of cancer. Through these agreements, MSD will assess new combination regimens based on Anti-PD-L1 immunotherapy, an experimental molecule known as MK- 3475.

Amgen presented the results of its phase II immunotherapy study with Blincyto (blinatumomab). In its 211 trial 40% of patients who took Blincyto achieved-complete remission (CR) or complete remission with partial hematologic recovery (CRh) and were able to undergo hematopoietic stem cells transplantation (HSCT).

Lipopharma completed a three-week treatment cycle with Minerval, a product for treating Glycoma and other solid tumours. The treatment cycle with this experimental molecule did not present safety or tolerability problems. This clinical study is in phase I/IIA MIN-001-1203

Merck Serono launched the "RAS Testing Platform", a project that provides information on the mutation status of the RAS genes (KRAS and NRAS) for patients with metastatic colorectal cancer (mCRC), candidates for first line of treatment with chemotherapy. They also announced a new retrospective analysis that showed clear benefits in the global survival of patients with metastatic colorectal cancer (mCRC) who have wild-type RAS tumours and received Erbitux in combination with FOLFIRI.

The Catalan Institute for Health (CatSalut), the Catalan Institute of Oncology (ICO) and the pharmaceutical company **Merck** have signed a new joint venture for the use of a drug prescribed for colon cancer. The agreement includes the condition that finance from the public administration will depend on the results offered by the cetuximab monoclonal antibody, commercialised as Erbitux and prescribed in some types of colon cancer.

The European Commission has authorised the commercialisation of Gardasil® by **Sanofi Pasteur MSD,** used for preventing precancerous lesions and anal cancer associated with oncogenic types 16 and 18 of Human Papillomavirus (HPV), in both men and women.

PharmaMar presented its new studies of Yondelis® (trabectecin) and PM1183, which are anti-tumour agents of marine origin. One of their trials is in phase II, and was carried out on patients with relapsed platinum-sensitive ovarian cancer. The company also presented a pivotal trial in phase II with Yondelis® in patients with sarcomas, presented by PharmaMar partner Taiho Pharmaceutical, for patients with sarcomas associated with genetic translocations.

The FDA approved the strategy proposed by PharmaMar for the production process of PM1183, an anti-tumoural agent under clinical development designed to treat haematological and solid tumours.

PharmaMar has also begun a phase I trial on Aplidin® combined with bortezomib and dexamethasone in patients with myeloma.

The Ministry of Health, Social Sciences and Equality of Spain has authorised the use of the Perjeta® monoclonal antibody (pertuzumab) by Roche, in patients with HER2 positive breast cancer. This approval will allow the combination of pertuzumab with the current standard treatment (Herceptin® + docetaxel) to treat unresectable locally recurrent or HER2-positive metastatic breast cancer, in patients who have not received anti-HER2 treatment previously or chemotherapy.

Thanks to the combined use of the experimental therapy cobimetinib GDC- 0973 and vemurafenib 'Zelboraf,' **Roche** was able to stop the progression of the advanced melanoma for more than a year, according to the latest findings.

BCN Health carried out an economic impact analysis of Ceplene® in combination with small doses of interleukin-2 (IL-2) for the treatment of adult patients with acute myeloid leukaemia (AML) who have received intensive chemotherapy and are in their first complete remission (CR-1).

Gilead have presented updated results of their study in phase II of GS-9973, their oral inhibitor is now in the research stage of spleen tyrosine kinase (Syk) to treat patients with recurrent chronic lymphocytic leukaemia (CLL).

Autoimmune and inflammatory diseases

VivaCell has been granted the patent for the use in the US of a cannabigerol derivative for the treatment of diseases associated with the nuclear receptor PPAR, such as inflammatory diseases.

Nervous System diseases

The joint venture between the British company Brainwave Discovery and **Inkemia IUCT Group** has presented its results; six components with high potential activity in combating Parkinson's.

IK4-TEKNIKER led the European project NEURIMP, in which **Histocell** is also participating. This project will work on the development of prosthesis, which will replace the autologous implantations that are currently used to cure peripheral nerve injuries. This will allow for the regeneration and re-establishment of connections between the sectioned nerve cells.

The vaccine against Alzheimer's developed by **Araclon Biotech** has begun its clinical trial with 24 human participants affected by this condition to test tolerability and safety.

Lilly and AstraZeneca have announced the inclusion of the first patient with early stage dementia to test Human βsecretase (BACE) oral inhibitor AZD3293/LY3314814 in their clinical trial now in phase I/II. **Biogen** had previously announced promising results of their trial in phase IIB of the canumab monoclonal antibody, now going onto phase III, Aducanumab. According to the company, the drug has achieved a substantial improvement of the cognitive performance of patients within 54 weeks versus placebo.

Rare diseases

SOM Biotech and the University-Hospital Vall d'Hebron have begun to administer patients the SOM0226 compound, a re-profiled drug for the treatment of trasthyretin amyloidosis (ATTR). Twenty patients will participate in this clinical trial, now in the stage of proof of concept in phase IIa. The new oral drug by SOM Biotech could mean significant cost reduction for the public health system. **SOM Biotech** announced that its SOM0226 compound for the treatment of trasthyretin amyloidosis (ATTR) had received Orphan Drug Designation in the US.

Valentia Biopharma announced that its VLT015 compound for the treatment of myotonic dystrophy had received Orphan Drug Designation.

Bionure announced that their first product under development, designed for the treatment of acute optic neuritis, had received Orphan Drug Designation by The European Medicines Agency (EMEA).

Esteve signed two agreements; one will allow them to develop their gene therapy for the treatment of Mucopolysaccharidosis type IIIA (MPSIIIA or Sanfilippo syndrome type A); and another to begin their clinical trial in phase I/II in 2015.

Sanifit began its clinical trials in phase I to treat calciphylaxis, a rare disease that affects 1-4% of patients with dialysis that have a life expectancy of one year since diagnosis.

A viral vector developed in Vall d'Hebron Institut de Recerca (VHIR) between the **CIBERER** Unit and The Gene and Cell Therapy Rearch Group has received Orphan Drug Designation by the European Medicine Agency (EMA). This virus is used for the treatment of Mitochondrial neurogastrointestinal encephalopathy (MNGIE), a lethal autosomal rare disease of recessive inheritance.

Infectious Diseases

Biomol-Informatics and **MEDINA Foundation** participated in the ENABLE project, which is focused on terminating bacteria resistance to antibiotics.

Bionaturis, Rovi and **Biomedal** participated in ADELIS, a public-private partnership designed to optimise drug liberation and administration processes, as well as finding solutions to antibiotic resistance.

The Committee for Medicinal Products for Human Use (CHMP), which is part of the EMA, has approved the use of Gardasil®, a quadrivalent vaccine developed by **Sanofi Pasteur MSD** to prevent the Human Papillomavirus (HPV). It may be administered in two doses in boys and girls of between 9 and 13, both included.

Scientists from **CSIC** have developed a prototype vaccine against chikungunya epidemic arthritis. According to the studies they have carried out, the prototype vaccine provides complete protection from this virus, which has affected millions of people in Africa and Asia since 2004.

The European Commission has approved the data sheet of 'Victrelis' (boceprevir), a drug developed by **MSD** that substantially improves the life quality of people with hepatitis C. **MSD** has also begun its study in phase III with MK-5172/MK-8742. The phase III programme, called C-EDGE, will evaluate the safety and efficacy of this combination - with and without ribavirin – in diverse genotypes and with different patients affected with Chronic Hepatitis C.

Bristol-Myers Squibb has also presented some promising findings for daclatasvir and sofosbuvir in Hepatitis C, genotype 3.

Others

One of **Bioibérica Farma's** latest clinical trials has proved the efficacy of combining chondroitin sulphate and glucosamine for the symptomatic treatment of knee arthritis.

Researchers at the **Spanish National Research Council (CSIC)** and the University of Salamanca have found a genetic cause for premature ovarian insufficiency. A mutation of STAG3 gene causes human infertility due to the loss of function of the protein it codifies.

Amgen launched an online platform (www.canalcolon.com) to keep health professionals up to date on everything concerned with metastatic colorectal cancer (mCRC).

Esteve and **BioPharma -** a group from the University of Santiago de Compostela - have created a unit for the development of new painkillers; obtaining promising results with their VXD-001 vaccine and the **Vaxdyn** VXD-003 treatment against nosocomial diseases in animal models.

Celgene has published its new data that demonstrates the benefits of OTEZLA® (apremilast) in psoriatic arthritis.

Almirall's Constella®, for the treatment of the irritable bowel syndrome with constipation, is now available in Spain.

Advanced therapies

TiGenix announced the clinical development of Cx611 (an allogeneic stem cell product administered intravenously) in patients who suffer early rheumatoid arthritis and people who suffer severe septicemia. The Committee for Medicinal Products for Human Use (CHMP) has renewed permission to sell ChondroCelec, a product by **TiGenix** prescribed to repair knee cartilage, for five more years.

In addition, the Paediatric Committee (PDCO) positively reviewed the Pediatric Investigational Plan (PIP) of Cx601 by **TiGenix**, a compound made from stem cells which is locally administered. Currently in phase III of clinical development, it is designed to treat complex perial fistulas in patients who suffer Chrohn's disease.

3P Biopharmaceuticals obtained the Good Manufacturing Practices certificate (GMP) for its manufacturing of a cellular drug prescribed for allogenic therapy.

The Spanish Agency of Medicines and Medical Devices (AEMPS) authorised **Stem Center** to carry out a randomised control trial, controlled by delayed treatment and evaluator-masked. This study will count with the safety and effectiveness of Renevia™, an absorbable matrix that helps administer autologous adipose tissue cells derived (ADSCs) to treat defects from HIV facial lipoatrophy.

A study carried out by the Telomere and Telomerase group of the **Spanish National Cancer Research Centre (CNIO)** showed the vital role SIRT1 protein has for telomere elongation and maintenance during cellular reprogramming; all of which leads specialised cells to an embryonic stem cell state. Researchers at **CNIO** carried out a study where they treated heart attacks with a new gene therapy based on telomerase enzymes. The findings in mice have revealed a 17% increase in survival after such heart conditions.

IQS has developed a bioinformatic application able to design new biocatalysts. Funded by the European Commission, **IQS** carried out RECATABI, FP7, a project for the development of a patent for a Bioactive implant or biopatch (composed of biomaterials and adult stem cells, from the same patient) that will help treat patients that have suffered myocardial infarction. The Project is in the preclinical stage.

biospain 2016

8th International Meeting on Biotechnology

September 28-30, 2016
Bilbao, Spain

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Jointly organized in its 8th edition by the Spanish Bioindustry Association (ASEBIO) and the Basque Business Development Agency (SPRI), **BIOSPAIN 2016** has become one of the leading biotech events in Europe, being the perfect setting for forging new partnerships and strengthening existing business relationships in the biotechnological industry.

BIOSPAIN 2014 results

- 2.000 attendees
- 855 entities
- 3.300 one-to-one meetings
- 200 exhibitors

5th largest partnering event in the world

- 50 investors
- 720 licensing opportunities
- 36 countries represented
- 60 sessions on the conference program

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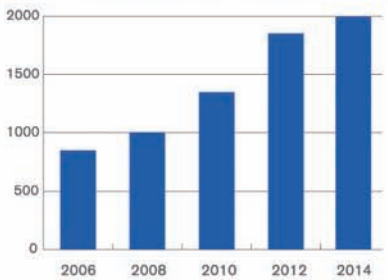
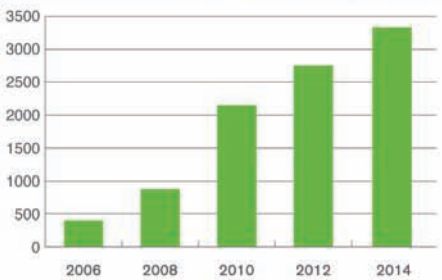
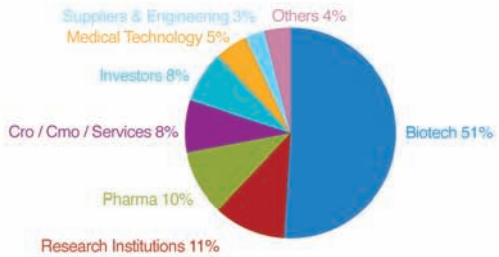
Evolution in the number of attendees

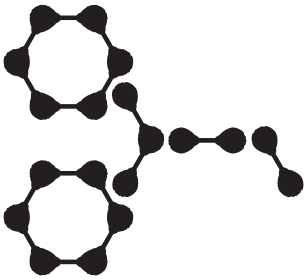


Evolution of the number of one-to-one meetings



Profile of participants by industry





6

Agrifood - Green biotechnology

6. Agrifood - Green biotechnology

Functional food

In February 2014, the National Consumer Institute and the Spanish Food Safety and Nutrition Agency were unified by royal decree-law, creating one new autonomous body, the Spanish Agency for Consumer Affairs, Food Safety and Nutrition (AECOSAN). Its mission is to supervise the activities of the different public and private entities directly or indirectly involved in consumer activities and nutrition, as well as to coordinate and inform about the situation of Spain and represent the country on the international stage in issues related to food safety, nutrition and consumer affairs, both within the European Union and overseas.

The following pages show the research activities carried out by biotech entities in this field.

The Spanish National Research Council (CSIC) has developed a genetically modified gluten-free whole wheat bread suitable for gluten intolerance, a product that conserves all its nutritional and organoleptic properties.

This new kind of bread is manufactured with wheat flower low in gladins. Gladins are the proteins responsible for gluten intolerance. For this process, gladins have been extracted by genetic modification. Lysine – an essential aminoacid for humans – compensates the deficit in gladins.

Researchers at the Institute of Dairy Products of Asturias (IPLA) and the **CSIC** obtained, after a selection, five probiotic bacterial strains that effectively improve microbiota in premature babies. This allows them to level the intestinal bacteria profile of premature babies with the one of babies who completed gestation and that were fed with breastmilk.

Another study carried out by **CSIC** (EEZ-CSIC) proved that FOS, a polysaccharide with bowel inflammation prebiotic properties, reduces the virulence of *Pseudomonas aeruginosa* - a bacteria that causes pneumonia, amongst other diseases - making it less resistant to antibiotics.

A study by the Biotecnología Enológica Aplicada group of the Institute of Food Science Research (CIAL) – a centre that is part of the Autonomous University of Madrid and the **CSIC** – showed that lactic acid bacteria found naturally in wine might have probiotic properties.

In October 2014 **AB-Biotcs** and **Sanofi** announced they would sell, for the first time in Spain, a probiotic to treat gastrointestinal problems in children. It will be commercialised as Sanogermin. The clinical study, carried out by **AB-Biotics** on infants with average crying of 60-240 minutes, demonstrated a reduction in 67.5% of the average crying time after 14 days of treatment with Sanogermin.

Biopolis, y Alifarma have signed an agreement for Alifarma to exclusively commercialise and distribute the probiotics developed and produced by **Biopolis** to the food and pharmaceutical industry and to the food supplement industry in Spain and Portugal.

The **IMDEA Food Institute** has initiated an intervention study on nutrition to evaluate the effect of rosemary extract on markers associated to cardiovascular risk in women with high waist circumference. It is a double blind randomized nutritional intervention trial on eighty participants; where half are taking diglyceride capsules and Rosemary extract, and the other half are taking control capsules, to determine the effect of the ingredients on markers associated with cardiovascular risk.

Bioibérica has launched the first milk for athletes that protects joints and maintains health. The product is enriched with Mobilee, an ingredient rich in hyaluronic acid, polysaccharides and collagen. The drink will be produced and commercialised by Central Lechera Asturiana, Sport Life and Bioibérica. **IQS** led a project aimed at finding a formula to produce infant milk that resembles human milk. During research, they developed biocatalysts from the B. bifidum lacto-N-biosidase enzyme. These biocatalysts were able to obtain complex oligosaccharides from disaccharides. Human Milk Oligosaccharides act like probiotics and immune system modulators in new-borns and are found abundantly in human milk and in colostrum.

Animal health

At Biospain2014 in Santiago de Compostela, **ArtinVet** – a company resulting from corporate spin-off Univet and the Basque laboratory **Histocell** – presented two new animal health products. The first is a Vexoderms dressing that acts on exudate reactive oxygen species in wet environments, designed to improve the condition of animal injuries. The second

is a service that offers artificial skin transplants produced in vitro. This artificial skin is able to effectively adhere to the injured skin, merging into the tissue and helping regeneration.

Bionaturis reached an agreement with a multinational veterinarian to develop a drug to induce ovulation in cattle before artificial insemination. **Bionaturis** will develop the product and will test the efficacy and safety of this new drug on animal models through its platform Flylife while the multinational will validate the results and apply them in field trials with the targeted species.

Neuron BioServices launched a new service to produce genetic tools and transgenic animals. This service covers the whole of the process: from designing and producing molecular tools to producing transgenic animals (zebrafish and mice) and their subsequent validation. **Neuron BioServices** is authorised to carry out animal testing with scientific and teaching purposes and is certified with categories A, B, C and D of animal protection in animals used for experimentation. EquiCord – a company based in Madrid Science Park – has patented a kit that allows competition horse breeders to conserve stem cells found in the umbilical cord tissue of foal.

Environment

The Basque Institute for Agricultural Research and Development **NEIKER**-Tecnalia is evaluating the effect of climate change on forest floor ecosystems by monitoring its microbial properties. They are carrying out this research at their Microbial Observatory in the national park of Ordesa and Monte Perdido. For this purpose **NEIKER**-Tecnalia is developing a massive sequencing analysis that sequences and identifies a large number of microorganism genes in a short space of time. This will lead to a better understanding of the structure and function of the microbial communities throughout the gradient of altitude.

The Institute of Natural Resources and Agrobiology of Salamanca (IRNASA, associated to **CSIC**) has developed a project aimed at identifying optimal biofertilisers for potato farming in order to reduce chemical fertilisation and therefore reduce pollution. The idea is to use endophytic microorganisms found inside the plant to make production more efficient. After analysing the diversity of these microorganisms and classifying the endophytic bacteria population, essential for plant growth, researchers are prepared to choose the most adequate microorganisms to inoculate into middle and late season potatoes; this is the specific objective of this project funded by the Autonomous Community of Castile-Leon.

Agriculture

The **CSIC** has defined the main genetic and environmental elements that cause mycotoxin in fungi, a toxic substance for animals and humans that contaminates and infects corn plants.

Scientists have searched for sources of resistance to contamination with fumonisins, which are the most abundant mycotoxins in Spain.

CSIC has also announced the development of a transgenic plant that generates renewable resources such as biofuels more efficiently. Scientists in this project manipulated hybrid poplars (*Populus alba* x *grandidentata*) to make them synthesise new lignin monomers (monolignol ferulate). These, after being incorporated to polymers, gave place to lignins which break down and degrade more easily. Lignocelluloses are made of three polymer compounds: cellulose, lignin and hemicellulose. Both hemicellulose and cellulose are used to obtain biofuels, amongst other materials.

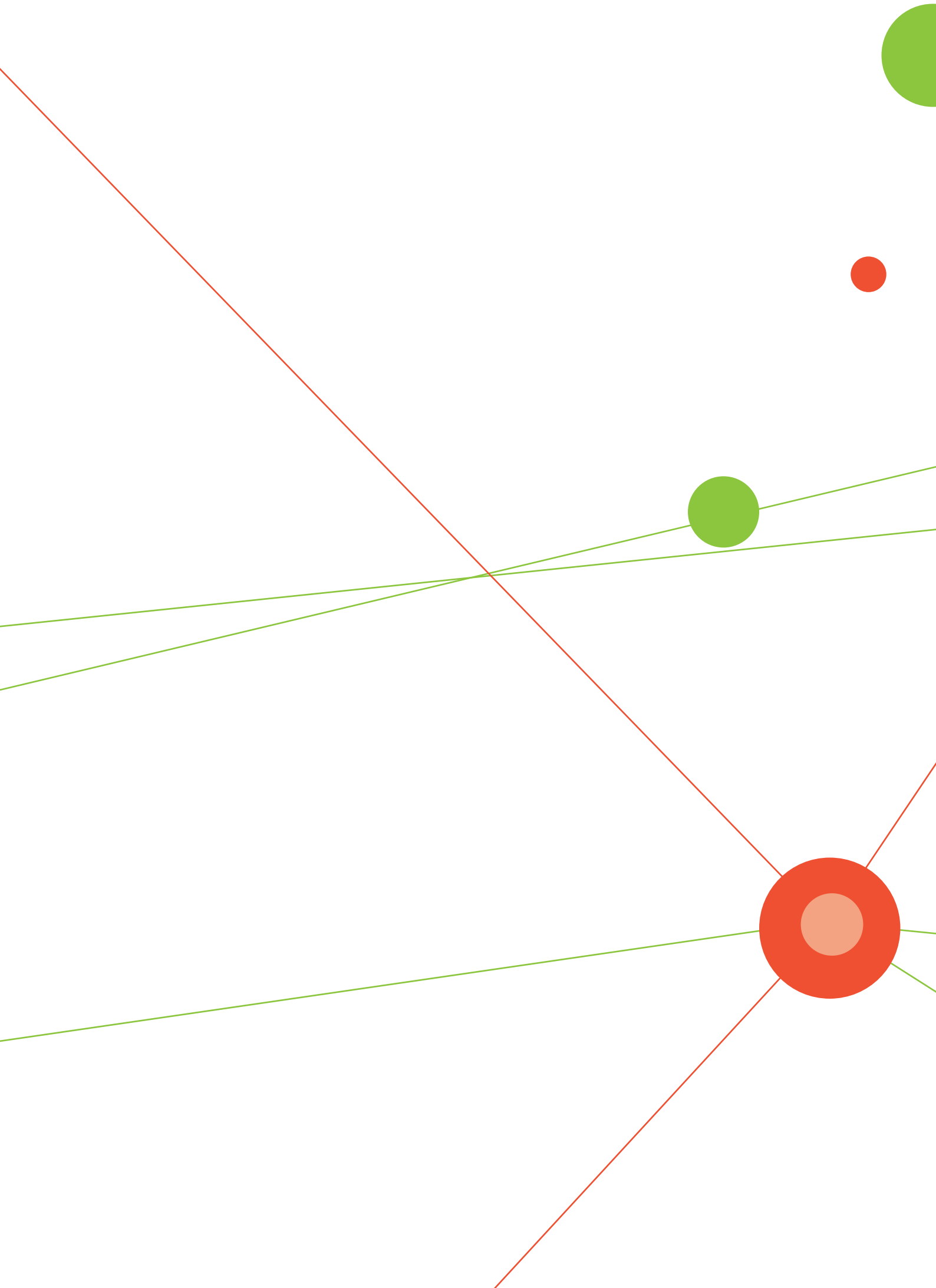
Researchers at the Institute for Plant Molecular and Cellular Biology of the Polytechnic University of Valencia and the CSIC were able to produce pollen-free durable antiallergic geraniums. This was achieved by introducing a gen that made them lose their anthers - where pollen is produced.

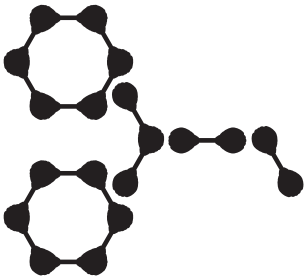
Neiker Tecnalia announced its involvement in Papaclima, a project designed to find potato genes that best adapt to climate change – decrease in rainfall and extreme temperatures. The goal is to identify the most resistant genes in order to create a new range of potatoes that adapt optimally to the future climate conditions. The study also intends to understand how these new kinds of potatoes will react to drought and higher and lower temperatures.

Phyture Biotech has launched its first product: the Arabian Cotton Stem Cells, a natural active ingredient that ensures synergistic photoprotection due to its combination with phytocompounds, ensuring global protection against sun damage.

As for GMO crops, the percentage of genetically modified (GM) corn crops in Spain has increased in 2014 to 31.6% of the total, 0.4% more than the previous year. According to the information published by the Ministry of Agriculture, Food and Environment (MAGRAMA), Spain has cultivated 131,537.65 hectares of genetically modified (GM) corn. The Autonomous Region of Aragon is still the leading region with 54,040 hectares, followed by Catalonia, with 36,381 hectares, Extremadura (13,814 hectares) and Andalusia (10,692 hectares). Catalonia and Navarre register the highest increase (614 y 251 hectares, respectively).

In February 2014, the autonomous regions of Spain had a preparatory meeting to reach agreements to prepare for the European convention that will take place on March the 3rd at the Environmental Council of the EU. The main agreement was that each member state of the European Union could restrict and even forbid the cultivation of transgenic crops, an issue that until now had been competence of the European Union exclusively.





7

Industrial - White biotechnology

7. Industrial - White biotechnology

Biotech applications for the production of energy

According to the International Energy Agency, 27% of motor fuels worldwide by 2050 will be biofuel, a considerable number compared to the 3% of 2012. This will therefore lessen dependence on crude oil and reduce greenhouse gas emissions.

Biofuels have contributed 18.1% less to the GDP in 2013, according to one macroeconomic impact study on renewable energy in Spain carried out by the Spanish Renewable Energy Association (APPA) that same year. The contribution to GDP of biodiesel and bioethanol in 2013 was 298.7 million euros. The study also found that biofuels reduced CO2 emissions by 1.2 million tonnes, the equivalent to greenhouse gas emissions from transport.

The National Commission for Markets and Competition (CNMC) published a statistic report in April 2014 about the biofuel market in the year 2013. This report shows that the market share of bioethanol was 3.6%, while for biodiesel and hydrogenated vegetable oil it was also 3.6%, falling short of the global objective that established a compulsory minimum of 4.1%. The use of biodiesel in Spain decreased by 58.5% and bioethanol also dropped 15.6%.

According to a report published by Navigant Research –a market research and consulting team–global demand for biofuels for road transport will go from 122,647 million litres in 2013 to 193,434 million litres in 2022. This report analysed the following fuels: conventional biodiesel and bioethanol, cellulosic ethanol, biogas, hydrogenated vegetable oil and biofuels obtained from biomass, residue, algae, and drop-ins.

In June 2014, the Council of the European Union established an objective for the use of biofuels in 2020. It stated that the use of first generation biofuels for transport must be 7% and 0.5% for second-generation biofuels. Second-generation biofuels are obtained from waste and other alternative sources such as straw – which produce less greenhouse emissions than fossil fuels – or other clean energy sources such as hydrogen or electricity. The latter is a voluntary objective.

According to recent data published by the RACC, if the consumption of biofuel is measured in kilotonne of oil equivalent, Spain is third (behind Germany and France) in the ranking for biofuel consuming states. When biofuel consumption is compared to the total energy consumed by the transport sector, Spain is second, behind Sweden.

IUCT, part of **InKemia,** obtained the Chinese patent for S50, a second-generation biofuel for diesel motors that uses residual glycerine from industrial biodiesel plants to produce more biofuel.

Neiker Tecnalia presented the results of Energreen, its research project co-funded by FEDER. The focus of this project was to find a breeding model that allows us to obtain microalgae biomass enriched in reserve lipids, useful to obtain high quality biodiesel.

Pharmaceutical group **Gadea** has bought biodiesel plant Biocyl – located in San Cristóbal de Entreviñas, Zamora, Spain –, which is supplied with equipment assets for the production of biofuels. The new company, Bioraw, will be the group in charge of these facilities, which will produce steroid precursors – by fermentation – through the biotransformation of green origin raw materials.

Abengoa has announced that they will produce bioethanol experimentally in their demonstration plant in Babilafuente (Salamanca). The technology they will employ, called waste to biofuels (W2B), will allow them to obtain biofuels of second generation through fermentation and enzymatic hydrolysis based on a transformation process. They will process 25,000 million tonnes of municipal solid waste (MSW) that will provide 1.5 million litres of bioethanol for use as fuel.

Research project EULAFUEL, promoted by an international consortium of universities and companies – with members such as the Institute of Plant Molecular Biology of the **CSIC**, and **Repsol** – is focusing its research on *Euphorbia lathyris,* a plant with the ability to grow fast in diverse climates with little water. This plant produces triterpenoids, a type of hydrocarbon used to make fuel.

Abengoa opened its first commercial plant for the production of biofuels in Hugoton, Kansas, in October 2014. The plant is producing cellulosic ethanol through enzymatic hydrolysis, a technology that transforms biomass into fermentable sugars to

then make ethanol. It uses inedible crop residue –second-generation biomass – to make ethanol. This plant is equipped with a cogeneration area to produce electrical energy.

Abengoa announced that it had been selected to design and build a commercial plant in Ghent, Belgium, to generate electrical energy using wood splinters and crop residue as biomass, in a process called the Circulated Fluidized Bed.

ASEBIO announced its participation with **Abengoa Research** in "Valorising Biorefinery By-Products" (VALORPLUS), a project destined to finding ways of building more sustainable and commercially viable refineries. The idea is to make a complete use of biomass without creating residues (closed loop). The objective is to study different biotech methods and treatments to obtain biorefinery subproducts, such as hemicellulose, lignin and glycerol; and make efficient biological products with added value – generating maximum value from the available resources and improving the efficiency of the process.

Researchers from the **Public University of Navarra** and the Agrobiotechnology Institute are carrying out a study with tobacco plants. They are studying genetically modified tobacco plants that produce 20 to 40% more ethanol, potentially making these plants viable as raw material for biofuels. Tobacco – when grown in high density and cut several times – could potentially produce 160 tonnes of fresh raw materials per hectare and become an ideal biomass source to produce ethanol.

Biopolymers and Bioplastics

According to European Bioplastics, only 1% of the world's daily production of plastic is bioplastic. However, growth forecasts for this industry are reassuring; the 1.4 million tonnes of plastic produced in 2012 could have multiplied to 6.2 million by 2017.

The Committee on the Environment, Public Health and Food Safety of the European Parliament has supported the idea of reducing the use of plastic bags by 80%, setting the objective of reducing use by 2019. This is an opportunity for the biodegradable and compostable plastic industries.

The **Institut Químic de Sarrià (IQS)** is participating in Nano3Bio, a European Project that is developing biopolymers derived from chitin, a useful substance in medicine, agriculture, water treatment, cosmetics, textile and the paper industry, among others. These biopolymers are obtained by combining biocatalysis and metabolic engineering.

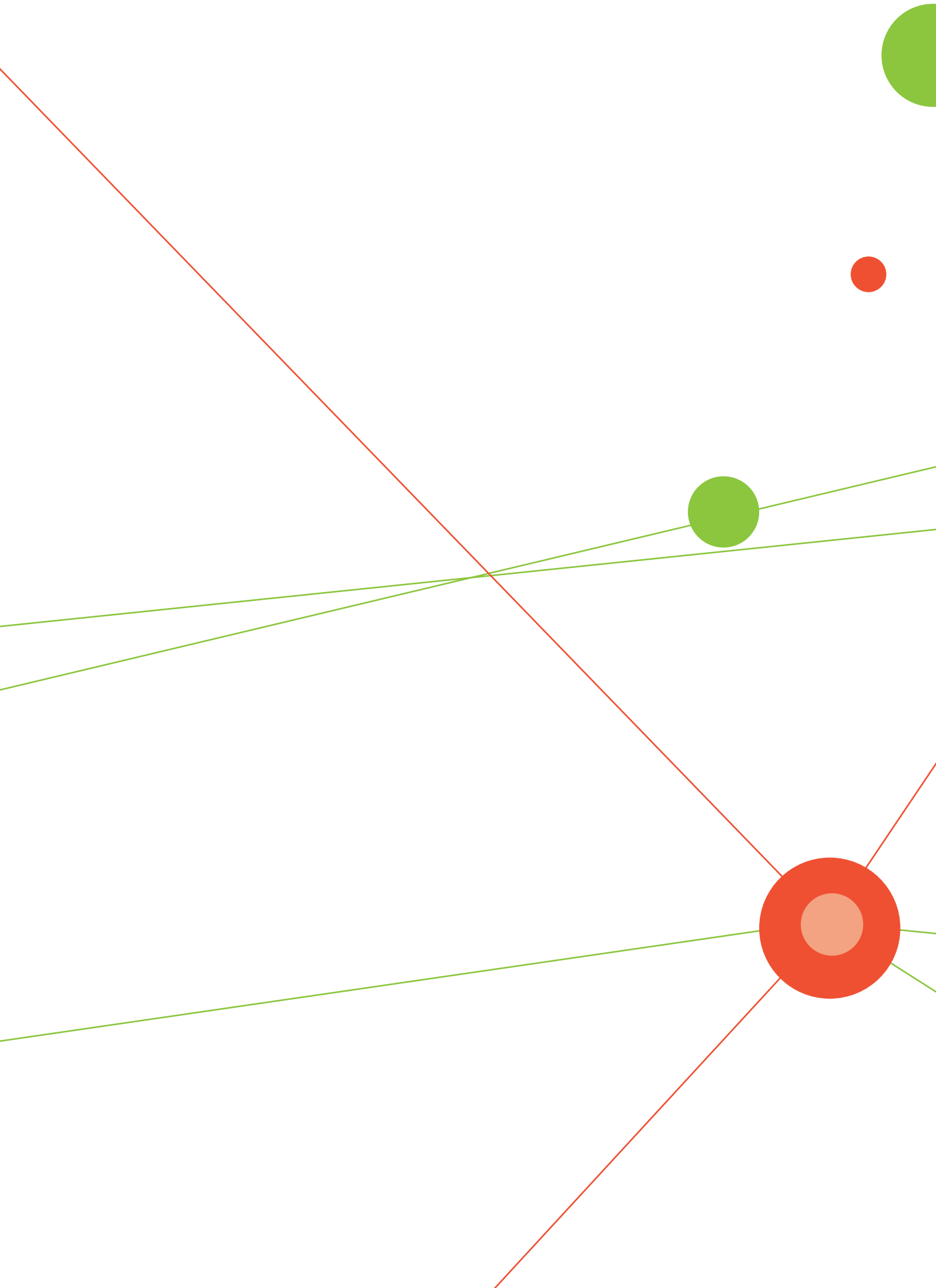
Bioprocesses and other bioproducts

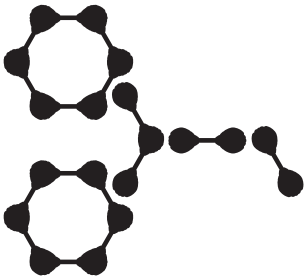
Neol obtained the American patent for MicroBiOil®, a platform that produces industrial oil from the transformation of organic and industrial residue. This oil is produced with Neoleum™, a selected microorganism improved with Neol.

GAIKER-IK4, together with E.I.A XXI Inc. will participate in FLEXIPHO, a R&D project designed to develop the conceptual design of a flexible and optimised photobioreactor (PBR) to grow microalgae in areas with low sun irradiance using CO2 from industrial plant emissions. This process creates biocompounds with added value for the food, cosmetic, nutraceutical and bioenergy industries.

ASEBIO together with the **Spanish Bank of Algae** has joined SEACOLORS, a project which is part of the LIFE+ programme. This project is aimed at researching natural dyes obtained from cyanobacteria, microalgae and macroalgae, a substainable and renewable source, suitable for dyeing biofibres that could potentially replace the current synthetic dyes. The consortium includes four partners that belong to two business associations and two research centres from Spain and Portugal.

ASEBIO, together with **IUCT** and Tecnalia, has joined "Ecopaint bio-based formulations" (ECOBIOFOR), a project that is part of the Seventh Framework Programme. The aim is to use renewable resources for the development of biologically based ecological paint thinner that could replace the ones used currently.





8 The Financial Environment

8. The Financial Environment

The biotechnology sector's biggest financial operation in 2014 was the acquisition of, Genhelix, a biotechnology firm, by **Chemo**, the pharmaceutical multinational. The sale of just under 10 million Euros was aimed at utilising the manufacturing capabilities of the Leon based plant.

3P Biopharmaceuticals, the Navarre based company specialised in the GMP manufacture of biopharmaceutical products and advanced therapies was at the centre of another big financial operation with a capital increase of 8 million euros. The operation means that Infarco, parent company of Cinfa and Cinfa Biotech, is now the majority shareholder in 3P.

Towards the end of 2014 **Sygnis** announced that it had increased its capital by 4.9 million euros. For the operation 2,475,678 new shares with a price of 2 euros were issued, drawing interest from existing and new shareholders.

Neuron took part in two important operations during 2014. The first was the acquisition of 50% of Neol Biosolutions from **Repsol** Energy for the sum of 4.5 million euros, thereby becoming the sole shareholder. The second operation was a capital increase of over 2 million in subscription shares.

Sanifit obtained 3.6 million euros in a financing round led by **Caixa Capital Risc** through the Caixa Innvierte BioMed II fund. The venture capital firm HealthEquity, the company Somtobir, the Nefrona Foundation, the *Centro para el Desarrollo Tecnológico Industrial* (CDTI) and a group of private investors were also involved in the round.

Venter Pharma and the **Ferrer** pharmaceutical group announced an agreement through which Ferrer has acquired 18% of the biotechnology firm Venter Pharma for 3.5 million euros. The operation involved a share acquisition from the partners and a capital increase.

Ferrer along with ICF Capital, Uninvest, Caixa Capital Risc, Espai d´Inversions 2005, Innova 31, Venture Cap and Asclepios BioResearch participated in the capital increase of **Genmedica Therapeutis**, a company which works on the development of new treatments for diabetes. The operation means Ferrer now owns 8% of Genmedica.

Along the year **Inkemia IUCT Group** undertook two important financing operations in the biotechnology sector. It acquired 100% of two companies: the *Laboratorio de Seguridad Alimentaria* (food safety) and the *Laboratori d'Anàlisis i Assessoria* (ASLAB). It also acquired 9% of LeanBio and 5% of Mind the Byte, a bioinformatics company specialised in scientific cloud solutions for the life sciences and drug discovery. Inkemia was also joined by other investors in the 1 million euro capital increase of **Phyture Biotech** and, to finish, it also launched a capital increase of 3.4 million euros from the Mercado Alternativo Bursátil (Alternative Equity Market - MaB).

Bionaturis has also been involved in various important operations in the sector. It closed a 3 million euro capital increase in which 74% of the subscription were raised from existing shareholders. It also bought **BBD BioPhenix**, a contract research organisation that helps clients from all around the world to develop tailored solutions to optimise productivity while minimising risks during R&D processes by integrating the zebrafish as an animal model with the latest innovative tools.

Life Length, which works on the commercialisation on Telomere Analysis Technology (TAT), raised 1.5 million euros through a capital increase with the participation of business angels. The Yamada Bee Company, a Japanese corporation, acquired 49% of the company for 1.5 million euros.

Natraceutical, part of the Grupo Natra, and **Reig Jofre** signed a merger agreement for takeover of Jofre by Natraceutical, which then changed its name to Laboratorio Reig Jofre. Reig Jofre Investments, the sole shareholder of Reig Jofre, received 935.57 million in new shares meaning it now owns 74% of all shares, thereby securing the threshold of 30% needed for voting rights. The merger has made Reig Jofre the fifth-largest Spanish pharmaceutical laboratory traded on the Spanish stock exchange after Grifols, Almirall, Rovi and Faes Farma.

Towards the end of 2014 **Zeltia** announced its plan to merge with its wholly owned subsidiary, **Pharmamar**, in order to apply for listing on the US stock market once the merger is complete. The merger and absorption of Pharmamar into Zeltia was due to take place in June 2015.

Venture capital

Suanfarma announced the launch of Suan Biotech II FCR, its second capital venture fund for biotechnology, for which it hopes to raise 20 million euros. The new fund would be used to invest between €500,000 and three million euros in 10 to 15 new business projects for a duration of four or five years. Among the participating investors are Suanfarma itself and the *Centro para el Desarrollo de Tecnología e Innovación (CDTI)* through its INNVIERTE programme.

The CDTI and **Inveready** also signed an agreement within the framework of the its INNVIERTE programme for the CDTI to invest up to five million euros in the new *Innvierte Biotech II* Inveready fund. This effectively set up a fund that will provide investment funding for up 20 business projects over the period 2014-2017.

In 2014 **La Caixa** set up it Caixa innvierte BioMed II fund, which will have 35 million euros to invest during the growth stage of companies from the life sciences. Investments will be of between 500,000 and 4.5 million euros. The fund was contributed to by Criteria Caixa- Corp, VidaCaixa, Institut Català de Finances (ICF), Laboratorios LETI and the CDTI through its INNVIERTE programme.

The same year, **La Caixa** announced the launch of Caixa Capital Micro II, which provides finance for innovative companies in their initial stages to help them take their products or services to market. With nine million euros available, the average investment will be of around 100.000 euros in the form of convertible participative loans.

The ICO announced which would be the nine venture funds to be selected for the third injection of cash by the FOND-ICO, Spain's public venture capital superfund. The selected funds will receive 194 million euros and they, in turn, promised to invest 669 million euros in Spanish projects. Of the selected funds three specialise in the biotechnology sector: **Suanfarma Biotech SGECR**, ClaveMayor SGECR and Talde Gestión SGECR.

About

BIOLATAM® 2015

NOVEMBER 16–17, 2015 // SANTIAGO, CHILE

BIOLATAM 2015 is the global event focused on Latin American biotechnology. This meeting is the perfect setting for forging new partnerships and strengthening existing business relationships in the Latin American biotechnological market.

Biotechnology is emerging in Latin America as a major economic sector, building new business and partnering opportunities. **BIOLATAM** contributes to a more favorable business environment, facilitating the creation and development of the industry in Latin America and its connection with the rest of the world.

BIOLATAM 2015 will combine conferences, business meetings, a trade exhibition and networking events, to facilitate contacts between international companies, investors, entrepreneurs, institutions and research centers in the field of biotechnology and related areas.

BIOLATAM 2013 results:

- 500 delegates at the partnering event from 294 companies
- 720 attendees
- 839 one-to-one partnering meetings
- 29 countries represented
- 23 exhibitors
- 17 investors
- 16 conferences

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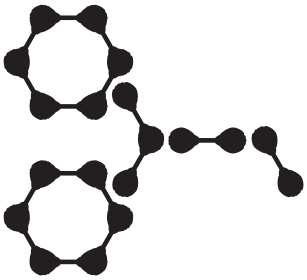
CentroParque



9 Internationalisation

9. Internationalisation

Spanish biotechnology in the international context

Key Indicators on Biotechnology – OECD

In October 2014 the OECD updated its "Key Indicators on Biotechnology". The study compares a number of variables in the countries which make up the organisation and others which do not but which have been included due to their importance, such as Russia, India, China and Colombia.

Great prudence must be exercised when interpreting the data due to the fact that, for certain variables, countries as important as the United Kingdom have no data, while in other areas the data provided is from previous years. Data collection methods may also vary from one country to another.

Number of firms active in biotechnology: Spain has gone from having 211 biotechnology companies in 2006 up to 625 in 2012 and in the process reaching one of the top positions in the OECD ranking. According to the OECD indicators, Spain is part of the top 10 countries with the largest number of biotechnology companies, beating countries such as Italy, Israel and Australia. The relevance of the statistic is the spectacular increase in the number of companies (a 200% jump) between 2006 and 2012, making it one of the biggest increases among OECD countries.

Biotechnology R&D expenditures in the business sector: In Spain 44.8% of private investment in biotechnology R&D comes from small companies, this is one of the highest percentages among OECD countries.

Percentage of dedicated biotechnology firms by application: Another interesting point raised by the OECD report is found in the breakdown by type of company. In the health and industrial biotechnology categories Spain is average among OECD countries with 56% and 15% of companies working in these areas. Spain stands out, however, for the number of companies which specialise in the food and beverage area (the highest proportion in the OECD, at 36%) and environment (at 17% this is the second highest percentage). What these numbers tell us is that although our biotechnology sector reflects that of other countries, it is also specialising in subsectors which in Spain are already very developed industries, such as the food and environment areas.

SCImago Country Rank

According to this ranking, in 2013 Spain continued in to be 10th place for scientific production. We should, however, consider that since 1996 (first year for which figures are available) Spain has dropped from 9th to 10th place. We should also bear in mind that, due to the size of their economies and population, countries like India, Brazil and South Korea will overtake Spain in scientific production within the next few years if

Table 7. Total expenditure on biotechnology R&D

	Total biotechnology R&D expenditure in millions of US dollars PPP*	Year
United States	26,138.00	2011
France	3,267.90	2012
Switzerland	2,560.00	2012
Japan	1,230.10	2010
South Korea	1,178.00	2012
Germany	1,150.70	2013
Denmark	940.30	2011
Spain	**764.20**	**2012**
Belgium	660.80	2011
Sweden	533.40	2011

Source: OCDE.

* Purchasing Power Parity

R&D investment in Spain continues at its current level.

Internationalisation Survey

This section details the conclusions drawn from the 2014 internationalisation survey for biotechnology firms which ASEBIO has now carried out among its members for the seventh year running.

90% of companies surveyed considered that internationalisation is "essential" for their business activities. If we then include the companies which consider it "important" we reach almost 100% of respondents, as has also been the case in previous years, which shows a clear commitment to internationalisation as an integral part of the sector's business model.

Of those companies which are not yet internationally active, 100% consider it to be one of their short-term objectives. Having been recently set up is the main reason given for the lack of international activity by Spanish companies (according to 71% of respondents). This is a significant change compared to the previous year, when the main reason was the prioritising of consolidation in the Spanish market.

According to the internationalisation survey, 88% of respondents is engaged in an international activity, two points higher than in 2013. The activities our members engage in outside our borders include (see table 8).

60% of ASEBIO member companies have a specialised international department, a clear increase over the figure of 53% from the previous survey.

The favoured markets for biotechnology firms are once again those in which the sector has matured enough to provide greater business and investment opportunities, such as the European and US markets, while South America continues to be the preferred option beyond these markets, ahead of Asia and the Middle East.

Once again, insufficient economic means continues to be the principal obstacle to internationalisation for 79% of companies. It is worth underlining, however, that this percentage has fallen from 100% in 2009, to 91% in 2012 and 85% in 2013. Other obstacles continue to include the lack of training for internationalisation, for 25% of companies (down from 32% in 2013), language barriers for 6.5% (13.04% in the previous survey) and the lack of entrepreneurial culture for 4% (from 8.7% in 2013).

We must conclude, therefore, that even though obstacles to internationalisation continue to exist, we are actually witnessing their progressive reduction.

Finally, ASEBIO members consider participating in fairs and partnerings to be the main tool for internationalisation and the identification of potential clients. We should mention that BioSpain, an event organised by ASEBIO, is the biggest biotechnology event in Spain and has received a positive response from 89% of respondents, five points higher than in the previous survey.

Table 8. Principal international activity by ASEBIO members in 2014.

Product or service exports	68.75%
Research alliance/collaboration	56.23%
European programmes	40.63%
Licensing out	35.94%
Commercial office	21.88%
Licensing in	18.75%
Representation office	14.06%
Eureka programme or similar	14.06%
Production plant	6.25%

Overseas expansion

The total number of ASEBIO member companies with an international presence remains unchanged since 2013 (43 companies). The number of international markets in which Spanish companies operate has increased, however, up to 47 countries across five continents in 2014.

The total number of overseas subsidiaries has also increased, experiencing a strong 20% increase. Biotechnology companies affiliated to ASEBIO now have a total of 159 overseas subsidiaries.

This significant rise in the global number of overseas subsidiaries has led to a decrease in the relative weight of the US, which has gone from hosting 18% of all subsidiaries in 2013 to 13% in 2014. The number of operations in South America, on the other hand, has increased, from 24% in 2013 up to 27% in 2014. Europe, meanwhile, maintains its position virtually unchanged, from 47% in 2013 slightly down to 46% in 2014. Asia and Oceania have gone up slightly (from 9% in 2013 up to 11% in 2014).

Table 9 lists, by country, where Spanish companies have a presence and how many subsidiaries there are.

Table 9. International presence of ASEBIO members by number of subsidiaries / branches / representation offices.

USA	21	TURKEY	2
PORTUGAL	11	UNITED ARAB EMIRATES	2
GERMANY	11	HONDURAS	1
UNITED KINGDOM	9	DOMINICAN REPUBLIC	1
ITALY	9	PANAMA	1
FRANCE	8	BOLIVIA	1
MEXICO	8	PARAGUAY	1
BRAZIL	6	GUATEMALA	1
COLOMBIA	6	EL SALVADOR	1
CHINA	5	VENEZUELA	1
SWEDEN	5	ECUADOR	1
CHILE	4	DENMARK	1
POLAND	4	AUSTRIA	1
CANADA	4	GREECE	1
ARGENTINA	4	MALTA	1
HOLLAND	3	CZECH REPUBLIC	1
BELGIUM	3	ESLOVAKIA	1
SWITZERLAND	3	MALASIA	1
COSTA RICA	2	THAILAND	1
PERU	2	AUSTRALIA	1
URUGUAY	2	ANGOLA	1
JAPAN	2	SOUTH KOREA	1
SINGAPORE	2	MONACO	1

Source: ASEBIO

Table 10 lists biotechnology companies associated to ASEBIO and the countries where they have a direct presence.

International alliances

Over 2014 a total of 97 international alliances were signed. A 10% decrease compared to the previous year, although during the 2009 - 2014 period the number of international alliances rose by 142%.

The geographical distribution generally mirrors that of previous years, though we should mention the decrease in alliances in South America and the US. Alliances with other European countries, however, have seen an 8% increase.

These numbers include any type of formal agreement between at least one Spanish company or institution and any other international entity involving an explicit agreement for a shared objective of any given nature (R&D, production, sales, etc.).

Table 10. Biotechnology member companies and countries in which they have a direct presence

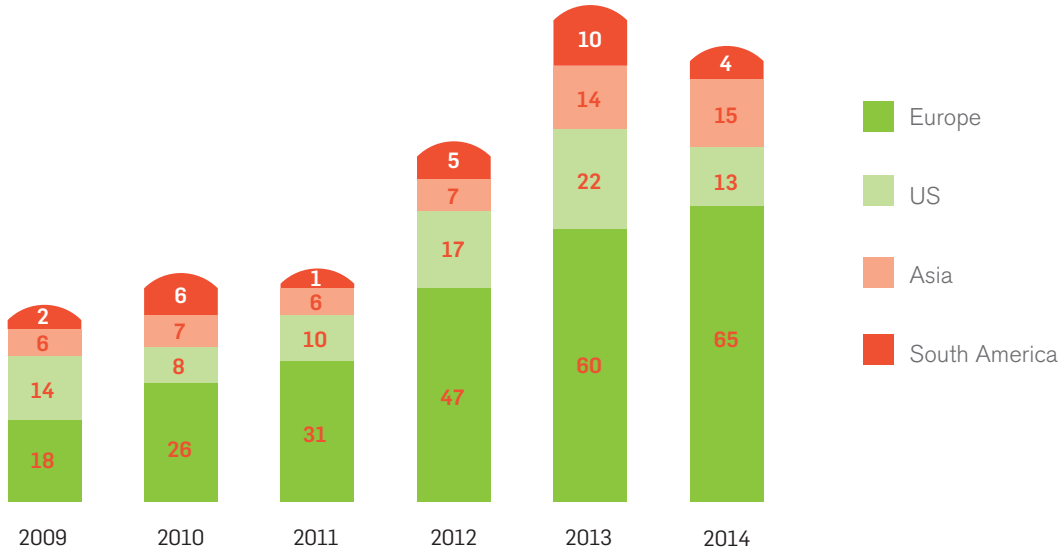
Companies	Countries
Abengoa Bioenergía	US, Holland, France and Brazil
Almirall	Canada, US, Mexico, Portugal, United Kingdom, France, Italy, Switzerland, Belgium, Holland, Germany, Denmark, Austria and Poland
ASPHALION	Germany
Azierta Contract Scientific Support Consulting	Colombia
Bioibérica	Poland, Brazil, US and Italy
Biomedal	US
BIONCOTECH THERAPEUTICS	US
BIONURE	US
Biotools	Brazil
BTI, Biotechnology Institute	Germany, Italy, Portugal, United Kingdom, Mexico and US
CORESOFT CLINIC	Argentina

Table 10. Biotechnology member companies and countries in which they have a direct presence (cont.)

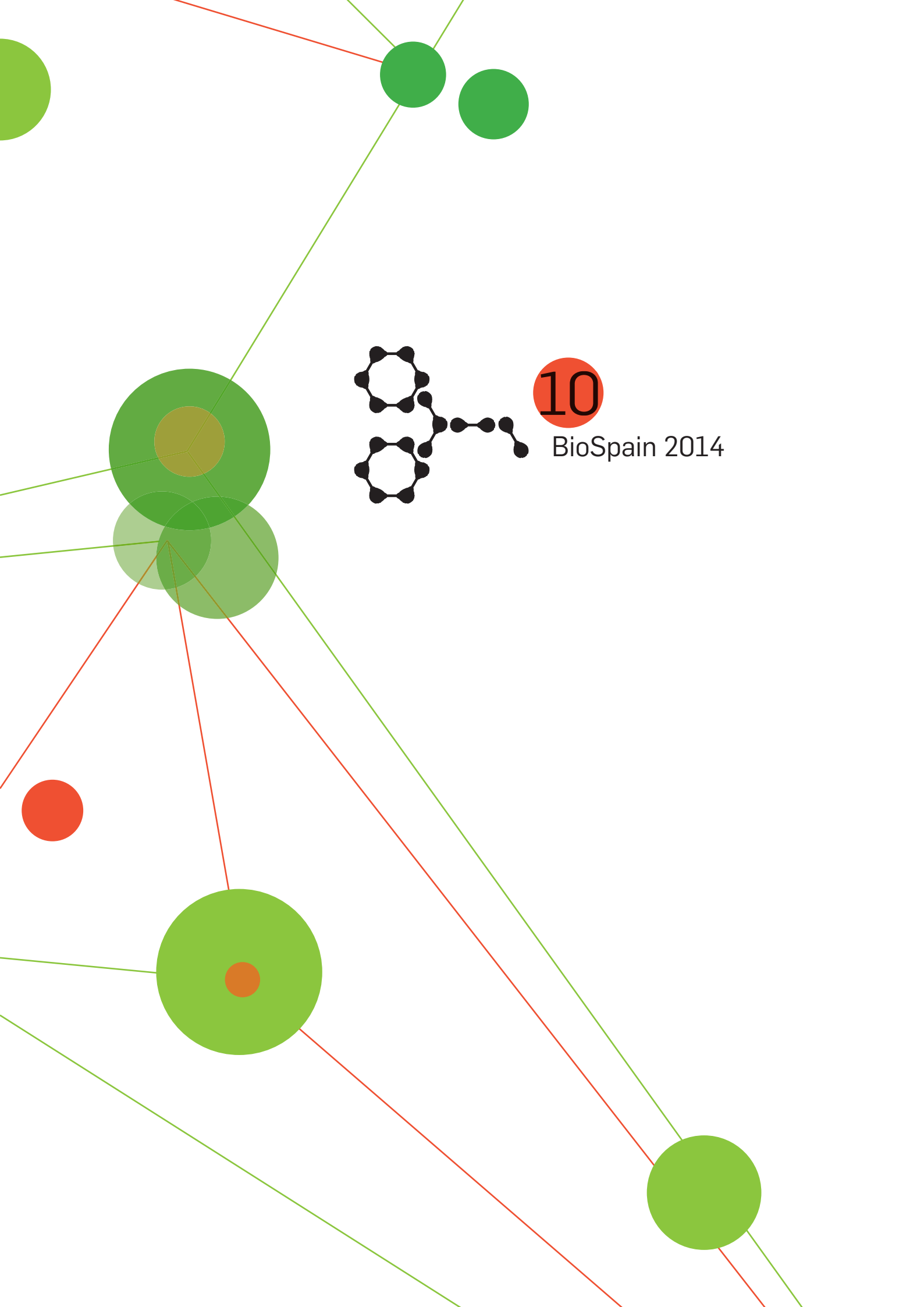
CYTOGNOS	Holland
ERA 7 Bioinformatics	US
Esteve	Portugal, Italy, Germany, Sweden, Turkey, Mexico, US and China.
Eurosemillas	China, Turkey, Poland, Mexico, Argentina, Chile, Brazil, Peru, Colombia, Angola, US and Japan
Gadea Biopharma	Malta and China
GENETADI Biotech	Mexico
Genetrix	Sweden
GENOMICA	Sweden and China
GRIFOLS	Czech Republic, United Arab Emirates, France, Germany, Italy, Poland, Portugal, Slovakia, Sweden, Switzerland, United Kingdom, Canada, Mexico, US, Argentina, Brazil, Chile, Colombia, Australia, Japan, China, Malaysia, Singapore and Thailand
Grupo Farmasierra	Portugal
Grupo Ferrer	France, Germany, Belgium, Greece, Portugal, US, Mexico, Honduras, Dominican Republic, Panama, Bolivia, Paraguay, Guatemala, El Salvador, Costa Rica, Colombia, Venezuela, Ecuador, Peru, Brazil, Uruguay, Argentina and Chile
Grupo Noraybio	France, United Kingdom and Italy
Grupo Reig Jofré	Monaco, Sweden, Belgium, Portugal, United Kingdom, Singapore and US.
Insights in Life Sciences (ilS)	United Kingdom
Intelligent Pharma	United Kingdom, US, Germany and Canada
Inveready	US
Laboratorios LETI	Germany and Portugal
Laboratorios Rubió	Portugal
Lipopharma Therapeutics	US
MABXIENCE	Switzerland and Uruguay
NATAC BIOTECH	US and Chile
Oryzon Genomics	US
Osteophoenix	Colombia
PharmaMar	US, Italy, Germany and France
Pharmaphenix	South Korea and US
Pivotal	Germany, United Kingdom, France, Italy and Portugal
Praxis Pharmaceutical	Portugal, France and Colombia
Progenika Biopharma	US and United Arab Emirates
Sequentia Biotech	Italy
Sermes CRO	United Kingdom
Sistemas Genómicos	Mexico, Canada and Costa Rica
SYGNIS BIOTECH	Germany

Source: ASEBIO

Figure 21. Evolution of geographical distribution of alliances involving ASEBIO members



Source: ASEBIO


10
BioSpain 2014

10. BioSpain 2014

BioSpain 2014, the 7th international Biotechnology Conference, is the main biotechnology event in Spain and one of the most important in the world. It took place between 24-26 September in the *Palacio de Congresos y Exposiciones de Galicia* (Galician Conference Centre), in A Coruña. It is a biennial event organised by ASEBIO, and for this occasion, jointly with the *Xunta de Galicia* (Galician Government), the *Universidad de Santiago de Compostela*, the *Universidad de Vigo* and the Concello de Santiago (Santiago City Council).

Its international character was reaffirmed once again this year: of the 855 public and private entities attending the fair, 12% more than on its previous edition, 289 were from overseas, representing a total of 37 countries. That means they made up 34% of the total, up front 28% in the previous edition - an increase in internationalisation of 37.6% compared to 2012.

66% of attending companies were Spanish, followed by 6.21% from the UK, 3.50% from France, 3.40% from Portugal, 2.93% from the US, 2.34% from Colombia, 2.34% from Mexico and 1.87% from Switzerland.

The 7th edition of BioSpain, which also coincided with the Year for Biotechnology in Spain and the 15th anniversary of ASEBIO, had 200 exhibitors and was visited by 50 investors, 80% of which were international. Capital venture funds, big pharma, investment funds, business angels and many others participated in the Investment Forum, where the business plans of 40 countries from all around the world were studied.

A total of 3,327 business meetings took place during the partnering event, an increase of 20% compared to the previous edition, while 2,000 participants took part in the event, an 8% increase, making BioSpain 2014 the fifth biggest event in the world in terms of business development meetings for the sector.

50 parallel scientific conferences took place, there were 37 presentations by companies and 720 ready-for-licensing products were presented during the partnering.

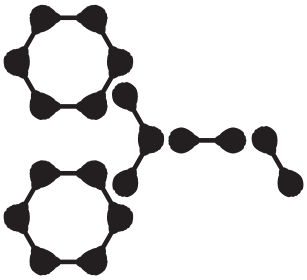
The BioSpain Organising Committee carried out a satisfaction survey among those who attended the event which found that 55% of those surveyed felt that the event met their expectations while another 37% said that it exceeded their expectations. 82% identified real business opportunities. The overall impression of the event was positive, with 54% describing it as good, 19% as very good and 24% as average, meaning 97% of participants were satisfied.

Ana Mato, then Minister for Health, Social Services and Equality, who was accompanied by Alberto Feijoo, President of the Xunta de Galicia (the regional government) and the British Ambassador Simon Manley, among others, were present at BioSpain 2014. There was also an inter-regional meeting which looked at issues such as health innovation policies, one of the key subjects covered during the event.

One of the outstanding new elements of the fair was the Biolatam Showcase, an exclusive space for South American biotechnology at which countries such as Peru, Argentina, Mexico, Colombia, Costa Rica, Brazil, Chile and Uruguay were present. Another was the *Xacobio*, an event which took place between the 21 and 23 of September during which 25 people from 17 countries shared an unforgettable experience as they made their way along the *Camino de Santiago*. There event also saw the second edition of the Training and Employment Forum, which was organised with the collaboration of FEBiotec, 297 jobseekers and 20 entities participated in the event, where 71 meetings took place.

Various prestigious scientific societies organised the ten scientific sessions programmed during BioSpain. There was also a Stakeholders Forum, allowing the event to open itself to an audience made up of people from outside the industry including patients, consumers, farmers and environmentalists who shared their experiences with us.

The official sponsors of BioSpain 2014 were Bioibérica, Merck, MSD, Zeltia Group, Roche Institute and CLAMBER (Castilla La Mancha Bioeconomy Region).



11 Who is who? – ASEBIO Members

Business members

3P Biopharmaceuticals, S.L.

AB BIOTICS S.A.

AbbVie Farmacéutica S.L.U.

Abengoa Bioenergy

Ability Pharmaceuticals, S.L.

AC-Gen Reading Life

Agroaxis

Agrocode Bioscience

Alexion Pharma Spain, S.L.

ALGAENERGY, S.A.

ALGENEX (Alternative Gene Expression S.L.)

Alma CG

Alma Management & Execution

Almirall, S.A.

ALTHIA

AMADIX

Amgen, S.A

Anapharm Europe

Aptus Biotech

Aquilón cyl, S.L

Araclon Biotech, S.L.

Archivel Farma, S.L.

Artinvet Innovative Therapies, S.L.

ASCIL BIOPHARM

ASPHALION

Azierta Contract Scientific Support Consulting, S.L.

Bayer CropScience NV

BBD Biophenix

BCN HEALTH

BIOCHEMIZE SL

Biocross

Biogen Idec Ibérica, S.L.

BIOGENETICS

Bioibérica S.A.

Bioimag Soluciones de Contraste S.L

Bioingenium, s.l.

BioinRen

Biokit Research & Developments, S.L.U.

BioMarin Europe Ltd. Sucursal en España

Biomedal, S.L.

BIOMOL-INFORMATICS SL

Bionanoplus, S.L.

BIONATURIS

BIONCOTECH THERAPEUTICS, S.L.

Bionet Ingeniería

Bionos Biotech S.L.

BIONURE

Biopolis, S.L.

Biosearch S.A.

Biosurgical

Biotech Development, S.L.

Biotools B&M Labs, S.A.

Bosques Naturales, S.A.

Bristol Myers Squibb

BTI Biotechnology Institute

Caixa Capital Risc

Camelina Company España, S.L.

Canvax Biotech S.L.

Capital Cell

Celgene

Celgene Institute of Translational Research Europe (CITRE)

CENTRO DE ESTUDIOS SUPERIORES DE LA INDUSTRIA FARMACÉUTICA

CIRCE Center for Intelligent Research in Crystal Engineering, SL

CORESOFT CLINIC SL

Coretherapix

Courier Medical Services

CRB Inverbío, S.G.E.C.R

Cubist Pharmaceuticals España, S.L.U

Curaxys

CYTOGNOS, S.L

DENCELLS BIOMEDICAL INSTITUTE S.L

Diomune S.L.

DREAMgenics, S.L.

EntreChem, S.L.

Enzymlogic

Era7 Information Technologies

Esteve

EuroGalenus Executive Search

Eurogenetics

Ferrer

Ferrer inCode, S.L.

Fibrostatin, S.L.

Fina Biotech

Formune S.L.

Gadea Biopharma, S.L.U.

Galileo Equipments, S.L.

Gendiag

Genera Biotech

GENETADI Biotech

Genetrix, S.L.

Genmedica Therapeutics

GENOMICA S.A.U

Genzyme

Gestión Sanitaria Siglo XXI

Gilead Sciences, S.L.

Glen Biotech S.L.

GP-PHARM, S.A.

GRADOCELL,S.L.

Gri-Cel SA

Grifols Engineering S.A.

GRIFOLS, S.A.

Grupo BioSerentia

Grupo Farmasierra

Harlan Laboratories

Health in Code

Histocell, S.L.

Hoffman Eitle

Immpulso Medical Sciences, S.L.

Immunostep, S.L.

Inbiomotion S.L.

Ingeniatrics

INKEMIA IUCT GROUP

Inmunología y Genética Aplicada, S.A.
INGENASA

INNOQUA Toxicology Consultants, S.L.

Innovaxis

Insights in Life Sciences (iIS)

Instituto de Medicina Genómica (IMEGEN)

Integromics, S.L.

Intelligent Pharma S.L.

Inveready

Iproteos

KYMOS Pharma Services, S.L.

Labgenetics, S.L.

Laboratorios LETI, S.L. Unipersonal

Laboratorios Rubió

Lean GxP Support S.L

Life Length

Life Science Praxis, S.L.

Lilly

Lipopharma Therapeutics

Logista Pharma

Lonza Biologics Porriño, S.L.

mAbxience

Making Genetics

Master Diagnostica, S.L.

Merck S.L.

Merck, Sharp & Dohme de España, S.A. (MSD)

Metas Biotech S.L.

Miltenyi Biotec

Minoryx Therapeutics

MONDRAGON Health

Monsanto Agricultura España, S.L.

Myriad Genetics España, S.L.U

n-life Therapeutics

Nanoimmunotech

nanoMyP (Nanomateriales y Polímeros, S.L.)

Nanotherapix, S.L.

Natac Biotech, S.L.

Neol Biosolutions, S.A.

Neuron Bio

Newbiotechnic, S.A.

NIMGENETIS, GENÓMICA Y MEDICINA, S.L.

Noray Bioinformatics, S.L.U. - NorayBio

Noray Biosciences Group (Noray BG)

Novo Nordisk

Omakase

One Way Liver Genomics, SL. (OWL)

Operon, S.A.

Oryzon Genomics S.A.

Osasen

Osteophoenix

Palobiofarma

Pangaea Biotech, S.L.

Parexel International

Pevesa, S.L.

Pharma Bio Seguros

Pharmamar, S.A.U.

Pharmaphenix

Phytogen Medical Foods

Phyture Biotech

Pioneer Hi-Bred Spain, S.L.

Pivotal

Plant Response Biotech S.L.

Plebiotic

PONS Patentes y Marcas

Praxis Pharmaceutical, S.A.

Progenika Biopharma, S.A.

Promega Biotech Ibérica S.L.

ProRetina Therapeutics, S.L.

PROTEOS BIOTECH, S.L.

ProtoQSAR

qGenomics

Raman Health

Recombina

Repsol

RJ Biotech Services

Roche Farma

Sabiotec Spin-Off

Sagetis Biotech

SANIFIT

Sanofi Pasteur MSD, S.A.

SARTORIUS STEDIM SPAIN, S.A.U.

Science & Innovation Link Office (SILO)

Secugen, S.L.

Seprox Biotech

Sequentia Biotech

Sermes CRO

Sigma Aldrich Química, S.L.

Sistemas Genómicos, S.L.

SmartLigs

SOM Biotech SL

Specific PIG S.L.

Spherium Biomed S.L

STAT-Diagnostica & Innovation, S.L.

Stem Center, S.L.

StemTek Therapeutics SL

Suanfarma Biotech S.G.E.C.R. S.A.

Sygnis Biotech

Sylentis, S.A.U.

Teraclon IDF, S.L.

Thrombotargets Europe, S.L.

TIGENIX SAU

Valentia Biopharma S.L.

Valoralia I+D

Vaxdyn

VCN Biosciences

Venter Pharma, S.L.

Vetgenomics, S.L.

VidaCord, S.L.

Vitae Caps

Vitagenia HealthCare

Vivacell Biotechnology España, S.L.

Vivia Biotech, S.L.

Vivotecnia Research, S.L.

VLP Bio

Ysios Capital Partners SGEIC, S.A

Zeltia

Zurko Research, S.L.

Other organisations

Agencia de Innovación y Desarrollo de Andalucía IDEA

Agencia Estatal. Consejo Superior de Investigaciones Científicas, CSIC

Banco Español de Algas

BioBasque, la Bioregión Vasca

Biocat

BIOIB (Cluster biotecnológico de las Islas Baleares)

BioMadrid

Centro de Investigación Médica en Red (CIBER)

Centro Nacional de Investigaciones Oncológicas, CNIO

Centro Tecnológico LEITAT

Federación Española de Enfermedades Neuromusculares

Fundacion Española para la Ciencia y la Tecnología

Fundación GAIKER

Fundación Imdea Alimentación

Fundación MEDINA (Centro de Excelencia en Investigación de Medicamentos Innovadores en Andalucia)

Fundación para la Investigación Biomédica de Andalucía Oriental (FIBAO)

Fundación para la Investigación Biomédica Hospital Universitario 12 de octubre

Fundación Parque Científico Tecnológico Agroalimentario Aula Dei (Fundación PCTAD)

Fundación Parque Tecnológico de Ciencias de la Salud de Granada (PTS)

Fundación Pública Andaluza para la Gestión de la Investigación en Salud de Sevilla (FISEVI)

Fundación Pública Andaluza para la Investigación de Málaga en Biomedicina y Salud

Fundación Pública Andaluza Progreso y Salud

Fundación Vasca de Innovación e Investigación Sanitarias

GENMIC: Grupo de Investigación de Genética y Microbiología

Gobierno de La Rioja. Dirección General para la Innovación

Grupo de Investigación BioFarma de la Universidad de Santiago de Compostela

Institut de Recerca Biomèdica de Lleida (IRBLleida)

Instituto de Biomedicina de Sevilla (IBIS)

Instituto de Investigación Biomédica (IRB Barcelona)

Instituto de Investigación Biomédica (IRB Barcelona)

Instituto de Investigación Sanitaria La Fe

Instituto de Salud Carlos III

Instituto Maimónides de Investigación Biomédica de Córdoba (IMIBIC)

Instituto Ramón y Cajal de Investigación Sanitaria

IQS

NEIKER - Instituto Vasco de Investigación y Desarrollo Agrario

Parc Científic de Barcelona (PCB)

Parque Científico de Madrid (PCM)

Proyecto CLaMber

Red de Entidades de Investigación Clínica Hospitalaria y Biosanitaria (REGIC)

Sociedad Española de Bioquímica y Biología Molecular (SEBBM)

Sociedad Española de Neurociencia (SENC)

Sociedad Española de Oncología Médica

Universidad CEU San Pablo

Universidad de Navarra

Universidad Europea de Madrid

Universidad Francisco de Vitoria

Veterindustria

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