Spanish White Biotech Pipeline*

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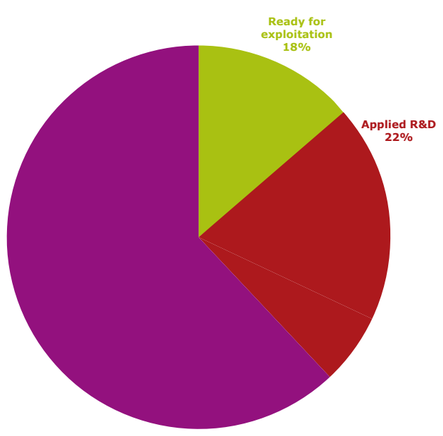
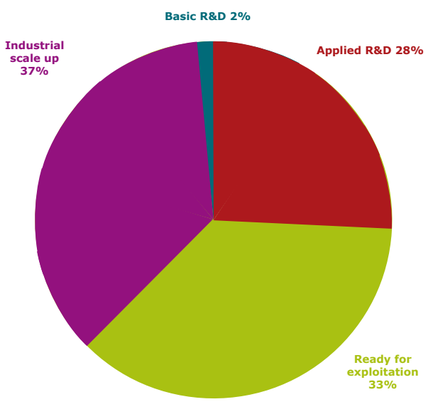
Spanish White Biotech Pipeline 2015

An overview of industrial biotechnology projects currently developed by the Spanish biotech industry

BIOPRODUCTS



BIOPROCESSES



ASEBIO, the Spanish Bioindustry Association, encompasses over 280 firms, associations, foundations, universities, technology and research centers which carry out activities directly or indirectly related to biotechnology.

The wide number of associates makes **ASEBIO** the most appropriate meeting platform to face up the challenges of developing the biotechnology sector in Spain.

Around 550 companies research and develop products in the Spanish biotechnology sector.

Spanish Bioindustry Association

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BIOPRODUCTS

Company	Name	Indication	Basic R&D	Applied R&D	Ready for exploitation	Industrial scale up	Available	Technology transfer in process	Patent
ABENGOA BIOENERGÍA		Cellulolytic and hemicellulolytic enzymes					✔		✔
ABENGOA BIOENERGÍA		Microalgae collection							
ABENGOA BIOENERGÍA		Sugars					✔		
ABENGOA BIOENERGÍA		DDGS (Dried Distillers Grains with Solubles)					✔		
ALGAENERGY	BLUE GOLD	C-Phycocyanin extract out of the microalgae Spirulina							
ALGAENERGY		Microalgae products with excellent properties for several applications and sectors					✔	✔	✔
Biomedal	ProPure rProtein A LCL Agarose	Immunoglobulin capture and purification affinity medium					✔	✔	✔
Biomedal	ProPure rProtein G Rapid Flow	Immunoglobulin capture and purification affinity medium					✔	✔	✔
Biomedal	ProPure rProtein A Rapid Flow	Immunoglobulin capture and purification affinity medium					✔	✔	✔
Biomedal	ProPure rProtein G FastCAp	Immunoglobulin capture and purification cartridges					✔	✔	✔
Biomedal	ProPure rProtein A FastCAp	Immunoglobulin capture and purification cartridges					✔	✔	✔
Biomedal	rProtein G (3xC)	Synthetic derivative produced by recombinant expression. Antibody purification					✔	✔	✔
Biomedal	rProtein A (4xZ)	Synthetic derivative produced by recombinant expression. Antibody purification					✔	✔	✔
Camelina Company España	Liquid biofuel	Camelina oil: Feedstock for Bio products (bioplastics, biolubricants, biopolymers, gondoic acid)					✔		
GAIKER - IK4		Antibacterial polymers and coatings and evaluation of biocide properties					✔		
INKEMIA IUCT GROUP	GC-S78	New solvent from renewable materials for Crop protection					✔		✔
INKEMIA IUCT GROUP	SOL-LAOC4 / GC-S77 / GC-DMA	New solvent from renewable materials for metal degreasing and for Paint and varnishes from DMA					✔	✔	✔
INKEMIA IUCT GROUP	GC-S79	Solvents from renewable materials for the biodiesel sector					✔		✔
INKEMIA IUCT GROUP	GC-BIO-DAP / BIO-AP	2,6-diaminopurine deoxiriboside. Anticancer / 2,6-diaminopurine riboside. Antiviral. Anticancer					✔	✔	✔
INKEMIA IUCT GROUP	BIO-TFT	Trifluorothymidine / Antiviral (Ophthalmic) / Herpes Cornea					✔	✔	✔
INKEMIA IUCT GROUP	GC-BIO-DF / GC-BIO-F	2-deoxy-5-fluorouridine. 5-fluorouridine. Anticancer / Colon & Pancreas / Colon & Breast					✔	✔	✔
INKEMIA IUCT GROUP	CAT-Bcun - Gbspum - Ssdeod	New catalyst Purine Phosphorilase Nucleoside					✔		✔
INKEMIA IUCT GROUP	CAT-Apudp / Bcpym / Hmudp	New catalyst pyrimidine phosphorilase nucleoside					✔		✔
INKEMIA IUCT GROUP	GC-S51	New solvent from renewable materials for synthesis of APIs					✔		✔
NANOIMMUNOTECH	NITZIPPER	Family of products ready to be easily, quickly and efficiently bioconjugated (antibodies, dyes, enzymes, micro/nanostructures, peptides, molecules, linkers, etc.)					✔		✔
PROTEOS BIOTECH	PBSerum	Enzymatic cosmeceutics					✔		
PROTEOS BIOTECH	PROTEOS-PCAI	Personal care active ingredients and products					✔		
PROTEOS BIOTECH	PROTEOS-RPROT	Recombinant proteins and growth factors					✔		
SEPROX BIOTECH	Hydroxytyrosol	Production of Hydroxytyrosol by chemical and enzimatic syntesis					✔		
SYGNIS BIOTECH	Sygnis Biotech	QualiPhi (next-gen version of Phi 29 DNA polymerase)					✔		✔
ABENGOA BIOENERGÍA		Microalgae collection							
Biomedal	nLZ4-Cys	Cost effective ligand for antibody purification					✔		✔
Biomedal	rProtein A Resins	Immunoglobulin capture and purification					✔		
Fundación MEDINA	MEDgene	Microbial Genetic Bank					✔		
Fundación MEDINA	MEDiversity	Microbial Collections					✔		
NEOL BIOSOLUTIONS		Microbial oils and oleochemicals by fermentation					✔	✔	✔
NEOL BIOSOLUTIONS		Yeast biomass for different end markets. High protein content and vitamins					✔		
Phyture Biotech		Plant cell cultures for dermatological applications							
SYGNIS BIOTECH	TruePrime™ Singel Cell WGA	Novel multiple displacement amplification (MDA) method based on the combination of the recently discovered TthPrimPol and Phi29 DNA polymerase for the amplification of genomic DNA from single cells					✔		✔
ABENGOA BIOENERGÍA		n-butanol							✔
AGROCODE	Trichoderma	Development production trichoderma with sterile process					✔		✔
Camelina Company España	Camelina germplasm	Screening program. Breeding program					✔	✔	
INKEMIA IUCT GROUP	BIO-CEM	New microorganisms for self healing concrete					✔		
INKEMIA IUCT GROUP	BIO-K3	Menadione (vitamin K3)					✔		✔
INKEMIA IUCT GROUP	CAT-Halolip / Haloprot	New halolipase/ New haloprotease					✔		
INKEMIA IUCT GROUP	CAT-Halo1 / Halo2	Enzymatic mixture with hydrolytic activity/with lipase and protease activity					✔		
INKEMIA IUCT GROUP	Bio-EPS	New exopolysaccharides use as nutraceutical and cosmetics (8 compounds)					✔		
LEITAT		Protein hydrolysates							
REPSOL		Biopolymer							
SYGNIS BIOTECH	Sygnis Biotech	New enzymes for DNA Amplification and Next Generation Sequencing							✔

BIOPROCESSES

Company	Name	Indication	Basic R&D	Applied R&D	Ready for exploitation	Industrial scale-up	Available	Technology in process	Patent
3P BIOPHARMACEUTICALS	CMO GMP certified	Analytics development and validation platform (API, IMP, IPC) for Biosimilars					✔		
3P BIOPHARMACEUTICALS	CMO GMP certified	Analytics development and validation platform (API, IMP, IPC) for New biological entities					✔		
3P BIOPHARMACEUTICALS	CMO GMP certified	Bioprocess Development/ Optimisation Platform (USP/DSP)					✔		
3P BIOPHARMACEUTICALS	CMO GMP certified	Freedom-to-operate platform in Bacteria, yeast and mammalian					✔		
BIOCHEMIZE	PB-ald	Enzymatic and microbial platform for aldolic condensations					✔	✔	
BIOCHEMIZE	PB-rac	Enzymatic and microbial platform for separation of racemic compounds					✔	✔	
BIOCHEMIZE	PB-met	Enzymatic and microbial platform for methylation of aromatic compounds					✔	✔	
BIOCHEMIZE	PB-oxi	Enzymatic and microbial platform for oxidation of aromatic methylenes					✔	✔	
BIOCHEMIZE	PB-red	Enzymatic and microbial platform for reduction of oxygen functional groups					✔	✔	
BIOCHEMIZE	PB-est	Enzymatic and microbial platform for esterification of organic compounds					✔	✔	✔
Biomedal	HISTAG-2nd-PHASE	Protein separation and purification of his-tagged proteins in aqueous two phase systems					✔	✔	✔
Biomedal	LYTAG-2nd-PHASE	Protein separation and purification					✔	✔	✔
Bionaturis	FLYLIFE	Baculovirus-based expression system at industrial scale (MVB, WVS, upstream, downstream)					✔	✔	
BIONET		Scale up and GMP facilities design					✔		
BIONET		Process Development/ Optimisation (USP and DSP)					✔		
BIOPOLIS	Bio-Ctl	Bioprocesses/biocatalysis					✔		
BIOPOLIS	Bio-BPL	Process development for biopolymers production					✔		
BIOPOLIS	Bio-Snt	Biosynthesis of chemical compounds					✔		
BIOPOLIS	Bio-Cl	Custom cloning and expression of recombinant protein					✔		
BIOSEARCH		Manufacture and Purification of plant extracts					✔		
Curaxys		Upstream & Downstream process					✔	✔	
GADEA BIOPHARMA		Process development & optimisation (USP & DSP)					✔		
GADEA BIOPHARMA		Scale up and production					✔		
GADEA BIOPHARMA		Biotechnological production of APIs							
GADEA BIOPHARMA		Biotechnological production of steroids							
GAIKER - IK4		Production in bioreactor of micro-algae (biodiesel and functional ingredients) and fermentation					✔		
GAIKER - IK4		Biopolymers development					✔		
GAIKER - IK4		Biological treatments for water purification					✔		
GAIKER - IK4		Contaminated soils bioremediation					✔		
Laboratorios LETI		Production of protein extracts/allergens					✔		✔
Lonza Biologics Porriño		Analytical services and stability studies of DS and DP					✔		
PRAXIS	Proteins & Peptides	Micro-nano-formulation, aseptic filling and freeze-drying					✔	✔	✔
ABENGOA BIOENERGÍA		Catalytic synthesis of n-butanol from ethanol					✔		
ABENGOA BIOENERGÍA		Biochemical production of monomers from sugars					✔		
ALGAENERGY		Biomass integral valorisation process					✔	✔	✔
Bionaturis	FLYPIDS	Recombinant expression of second generation vaccines (VLPs, chimeric, subunits)					✔		✔
BIOPOLIS	Bio-Bph	Production of biopharmaceuticals, key organic compounds and green chemicals					✔		
BIOPOLIS	Bio-Rp	Production and purification of recombinant proteins					✔		
BIOPOLIS	Bio-PHA	Process Development for PHA production					✔		
Fundación MEDINA		Isolation of new natural products from microbial fermentations					✔		
Fundación MEDINA		Fermentation of new fungal and bacterial strains with biotechnological applications					✔		
GADEA BIOPHARMA	Ps	Aseptic lyophilisation and filling of APIs							
GADEA BIOPHARMA		Bacterial and fungal fermentation and DSP							
GAIKER - IK4		Fermentation. Production of microorganisms and recombinant proteins					✔		
GAIKER - IK4		Biofunctional nanoparticles synthesis					✔		
GAIKER - IK4		Bioremediation					✔		
GAIKER - IK4		Biodetergency					✔		
INKEMIA IUCT GROUP	Bio-PROC	Substitution of chemical processes for bioprocesses					✔		
INKEMIA IUCT GROUP	Bio-SRC	Prospection, isolation, characterization and performance of new microorganisms in industrial biotechnology					✔		✔
nanoMyP	Tiss Series	Synthesis of nanostructured tissues for biocatalytic processes							
NEIKER		Production of carotenoids from microalgae							✔
NEIKER		Production of Omega-3-Rich Oil from microalgae					✔		
NEIKER		Production of Recombinant Proteins					✔		
NEOL BIOSOLUTIONS	MICROBIOL	Production of microbial oils and oleochemicals from residues					✔	✔	✔
Phyture Biotech		Development of plant cell cultures as new cosmetic actives ingredients							
PROTEOS BIOTECH	PROTEOS-PPDA	Proteolytic processes - dairy applications							
PROTEOS BIOTECH	PROTEOS-PPMW	Proteolytic processes - meat waste							
PROTEOS BIOTECH	PROTEOS - PRP	Production of Recombinant Proteins					✔		
PROTEOS BIOTECH	PROTEOS - PEX	Protein expression systems					✔		
PROTEOS BIOTECH	PROTEOS - BFERM	Bacterial fermentation					✔		
Bioibérica		Biogas production plan project from fat							
Curaxys		Production of Monoclonal Antibodies (GMP)					✔	✔	
Curaxys		Manufacture and Purification of Recombinant Proteins (GMP)					✔		
LEITAT	Monoclonal antibody	Generation, humanization, production, purification					✔		
LEITAT		Isolation of new producing strains and consortia for bioproduct obtaining. (e.g. biosurfactants, biopolymers, enzymes, etc.)							
LEITAT		Microbial Fuel Cells for electricity generation. Partial anaerobic digestion of wastewater for MFC operation					✔	✔	
LEITAT		Enzymatic and microbiological synthesis of antimicrobials							
LEITAT		Enzymatic synthesis of prebiotic ingredients							
LEITAT		Obteining protein hydrolysates							
LEITAT		Enzymatic improvement of fats and fat valorisation							
LEITAT		Substitution of chemical processes by bioprocesses							
LEITAT		Bioprocess for textile processing							
LEITAT		Biotechnological cotton process					✔		
LEITAT		Biosurfactant production processes from commercial and renewable feedstock							
LEITAT		Biogas production from waste and effluents							
LEITAT		Enzymatic and physic-chemical protein hydrolisation processes. Collagen, keratine hydrolisates and vegetable protein hydrolisates for fertilizers, cosmetics and feed							
NEOL BIOSOLUTIONS	TRIBIOPLAST	Production of biopolymers (medium and long chain poly-hydroxy-alkanoates)					✔	✔	✔
NEOL BIOSOLUTIONS	SW-3 OILS	Production of DHA-rich Omega 3 Oil						✔	
Neuron Bio	NST-Pkt	Biosynthesis of new polyketides derivatives					✔		✔
Phyture Biotech		Development of plant cell cultures for dermatologic pathologies							
PROTEOS BIOTECH	PROTEOS-BS	Production of Biosimilars							
PROTEOS BIOTECH	PROTEOS-MBP	Microbial biogas production							
PROTEOS BIOTECH	PROTEOS-BPEFA	Biocatalysis processes - Essential fatty acids							
PROTEOS BIOTECH	PROTEOS-PPDET	Proteolytic processes - detergents applications							
GAIKER - IK4		Development of soil remediation process based on nanoparticles					✔		
Phyture Biotech		Recombinant proteins production through plant cell cultures platform							

*Based on data provided by ASEBIO associated companies. MAY 2015.

Spanish White Biotech Pipeline*

TECHNOLOGIES

Company	Name	Indication	Basic R&D	Applied R&D	Ready for exploitation	Available	Technology transfer in process	Patent
ALGAENERGY		Microalgae production facilities, technologies, control and harvesting systems				✔	✔	✔
ALGAENERGY		Microalgae Production Technology for several applications				✔	✔	✔
BIOCHEMIZE		Enzymatic technological platform for advanced aldolic reactions				✔	✔	
BIOCHEMIZE		Enzymatic technological platform for advanced esterification reactions				✔	✔	
BIOCHEMIZE	SC-enz	Enzymatic screening for modification of chemical structures				✔	✔	✔
BIOCHEMIZE	PB	Screening for microbial and enzymatic biocatalysis				✔	✔	✔
Biomedal	CASCADE	Bacterial expression system				✔	✔	✔
BIOMOL-INFORMATICS	BIOMOL- HTCM	In silico drug discovery through combinatorial quimioinformatics				✔	✔	
Bionaturis	FLYPIDS	Recombinant expression of second generation vaccines (VLPs, chimeric, subunits)				✔		✔
Bionaturis	FLYLIFE	Baculovirus expression system. MVB, WSVB, upstream development, downstream development, analytical development, scale-up				✔	✔	✔
BIONET	BIONET	Serial CIP units				✔		
BIONET	BIONET	Serial 350-1000 L. Bioreactor				✔		
BIONET	BIONET	Serial 5 L. Bioreactor				✔		
BIONET	BIONET	Membrane filtration technologies				✔		
BIONET	BIONET	Fermentation technologies				✔		
BIONET	BIONET	Serial Membrane filtration units				✔		
BIOPOLIS	Bio-CI	Recombinant protein expression for therapeutic and diagnostic application						
BIOPOLIS	Bio-Cpe	High added value compounds extraction				✔		
BIOSEARCH		Testing laboratory accredited by ENAC according to ISO17025				✔		
BIOSEARCH		Pilot plant in main food applications. Preparation of dairy prototypes and other food matrices				✔		
BIOSEARCH		Screenings for antimicrobial, antiobesity, inhibitory of cholesterol absorption activity				✔		
Curaxys		Biosimilars monoclonal antibodies Platform				✔		
Fundación MEDINA		Bioanalysis mass spectrometry platform				✔		
Fundación MEDINA	MEDScreen	High Throughput Screening of Biotechnological Products				✔		
Fundación MEDINA	MEDchemistry	LCMS & NMR Analytical Platform				✔		
Fundación MEDINA	MEDmicro	Microbial Fermentation & Scale Up Platform				✔		
Fundación MEDINA	MEDiscovery	Bioactive Molecule Discovery Platform				✔		
GADEA BIOPHARMA	Ps	Sterile final pharmaceutical forms						
GAIKER - IK4		Photobioreactor				✔		
GAIKER - IK4		Pyrolysis				✔		
GAIKER - IK4		Spray-drying				✔		
GAIKER - IK4		CO2 Supercritical				✔		
GAIKER - IK4		Incorporation of active substances in textile fibers				✔		
GAIKER - IK4		Microencapsulation of biosubstances, active ingredients, and essential oils				✔		
GAIKER - IK4		Active packaging				✔		
Ingeniatrics Tecnologias	ATOMIZATION EQUIPMENT / COATING SYSTEMS	Development and manufacturing of proprietary technology nebulizers, atomisers, and equipment or devices including it/coating systems				✔	✔	✔
Ingeniatrics Tecnologias	FLOW SPRAY-DRYER	Brand-new spray-drying and spray-chilling equipment integrating proprietary technology emitters for highly accurate and efficient microparticles production				✔	✔	✔
Ingeniatrics Tecnologias	CELLENA	User-friendly bioencapsulation portable platform to encapsulate high molecular weight compounds, microorganisms and cells				✔	✔	✔
Ingeniatrics Tecnologias	FBM (Flow Blurring® Metal)	High throughput nebulizer for material process: drying, pulverisation, etc. Able to operate with highly viscous materials				✔	✔	✔
Ingeniatrics Tecnologias	ONENEB	Improved sensitivity and robustness analytic nebulizer and micronebulizer for spectrometry systems				✔	✔	✔
Ingeniatrics Tecnologias	FLOW BLURRING ®	Highly efficient spray of extremely fine droplets production				✔	✔	✔
Ingeniatrics Tecnologias	FLOW FOCUSING ®	One step microencapsulation producing small & homogeneous spheres, core-shell, double-shell particles				✔	✔	✔
Ingeniatrics Tecnologias	MICROPARTICLES DEVELOPMENT	Customised CRO microencapsulation services for cosmetics, chemicals, consumer goods, Including SPHERES, CORE-SHELL and DOUBLE SHELL structure				✔	✔	✔
Ingeniatrics Tecnologias	MICROPARTICLES MANUFACTURING	Tailored in-plant scaled-up manufacturing				✔	✔	✔
INKEMIA IUCT GROUP	Bio-HTB	High throughput biotechnological synthesis of small molecules						
INKEMIA IUCT GROUP	CG-Bio-GMO	Molecular biology: genetically modified microorganism						
INKEMIA IUCT GROUP	GC-SOLV	Substitution for green safer solvent from renewable resources in different industrial applications						
Laboratorios LETI		Protein Purification				✔		
Life Length	TAT	Telomere measurement				✔		
Lonza Biologics Porriño		Analytical Services for the Biotechnology Industry				✔		
Lonza Biologics Porriño		Custom manufacturing of monoclonal antibodies and recombinant proteins using mammalian cell culture				✔		
Lonza Biologics Porriño		Stirred bioreactors 5.000 & 10.000 L. scale & single-use bioreactors				✔		
NANOIMMUNOTECH	NITmagold: Portfolio of gold-coated magnetic nanoparticles (different surfaces available) (NITPARTICLES)	Magnetic separation. Biosensing. Magnetic hyperthermia. Drug delivery				✔		
NANOIMMUNOTECH	NITgold clusters: Gold nanoclusters (different sizes available) (NITPARTICLES)	Bioconjugation. Immunocytochemistry. Microscopy probe. Cellular uptake. Immunogold Immunosensing. Catalysis. Optoelectronic				✔		
NANOIMMUNOTECH	NITgold Lipoic: Portfolio of Lipoic gold nanoparticles (NITPARTICLES)	Design of biosensors. Target-specific drug-delivery. Imaging probes for dark-field microscopy. Cancer photothermal therapy. Optoelectronic				✔		
NANOIMMUNOTECH	NITgold COOH-PEG: Portfolio of COOH-PEG coated gold nanoparticles (different sizes available) (NITPARTICLES)	Design of biosensors. Drug delivery. Colorimetric probes. Cellular uptake				✔		
NANOIMMUNOTECH	NITgold Cit: Portfolio of Citrate-coated gold nanoparticles (different sizes available) (NITPARTICLES)	Design of biosensors. Target-specific drug-delivery. Lateral flow tests. Imaging probes for dark-field microscopy. Flow cytometry. Cancer photothermal therapy. Catalysis. Optoelectronic				✔		
NANOIMMUNOTECH	LinkOriented Kits: Kits for oriented conjugation of proteins on nanoparticles. (NITBIOCONJUGATION)	Lateral flow. Design of biosensors. Bioconjugación. Microscopy probe. Immunogold. Immunosensing				✔		
NANOIMMUNOTECH	HEATSENS, innovative nanobiosensing technology for ultra-sensitive, rapid and easy detection of analytes of interest (NITBIOSENSING)	Detection of analytes in very different kinds of areas such as human and animal diagnostics, environment, agri-food, cosmetic, pharmaceutical, etc.				✔		
NANOIMMUNOTECH	NITBIOSENSING	Colorimetric biosensing platform based on the innovative properties of nanotechnology				✔		
NanoMyP	Tiss® Series	For the chemical immobilisation of any type of molecule, preparation of assay and diagnosis kits, novel optical sensing phases, intelligent packagings, detector for bioreactors, water or gas filters, etc.				✔		
NEIKER		Soil microorganism detection				✔		
NEIKER		Development of microalgae culture strategies to obtain high lipid biomass content						
NEIKER		Protein purification				✔		
NEOL BIOSOLUTIONS	MICROBIOTOOLS	Platform for bioprocesses development; selection, optimisation and scale-up of microorganisms for industrial applications				✔	✔	
NEOL BIOSOLUTIONS	MICROBIOIL-2	Production of microbial oil from lignocellulosic residues (wheat straw)				✔	✔	✔
NEOL BIOSOLUTIONS	MICROBIOIL-1	Production of microbial oils from crude glycerine				✔	✔	✔
Phyture Biotech		Plant cell cultures technology for the development of dermocosmetic products						
Plebiotic		Reverse docking, for repositioning of existing drugs				✔		
Plebiotic	PleMD v2	Molecular Dynamics software - drug discovery, analysis of action mechanisms				✔		
Plebiotic	PleMD	Molecular Dynamics solution				✔		✔
PROTEOS BIOTECH	PROTEOS-BESE	Bacterial expression system in E. coli				✔		
PROTEOS BIOTECH	PROTEOS-MEM	Microemulsification of active ingredients and enzymes				✔		
PROTEOS BIOTECH	PROTEOS-MENC	Microencapsulation of active ingredients and enzymes				✔		
PROTEOS BIOTECH	PROTEOS-PPS	Protein Purification System				✔		
BIOMOL-INFORMATICS		Generating 3D computer models for bacterial protein polymers as scaffolds for nanowires						
LEITAT	Protein hydrolysis	Protein are broken down into amino acids or peptides applying enzymatic and phyico-chemical technologies for obtaining functional hydrolysates (enriched in active peptides with different industrial applications)				✔		
LEITAT		Anaerobic digestion and partial anaerobic digestion						
LEITAT		Enzyme immobilisation						
LEITAT		Protein purification						
LEITAT		Biosurfactant production						
LEITAT		Antimicrobial / antifungal /antibiofouling and quorum sensing inhibitors screening						
NEOL BIOSOLUTIONS	SW3-OIL	Production of DHA rich-Omega3 Oil					✔	
NEOL BIOSOLUTIONS	MICROBIOIL-3	Microbial production of tailor-made oils and oleochemicals					✔	✔
Phyture Biotech		Plant cell cultures technology for recombinant proteins production						
Plebiotic		Molecular design of antibodies				✔		
PROTEOS BIOTECH	PROTEOS-BESB	Bacterial expression system in Bacillus megaterium						
Ingenasa	Multi DETECT	Detection of diferent infectious agents in a single multiplex assay, based on microarray technology				✔		

BIOFUELS

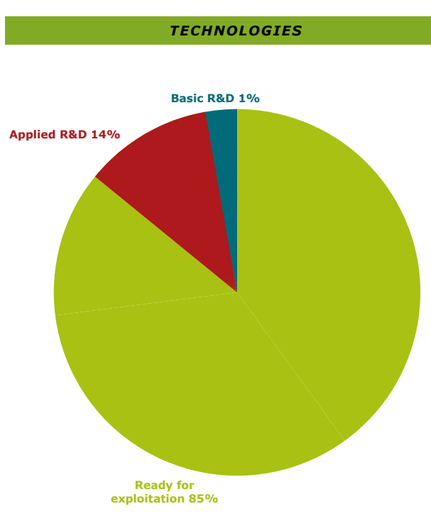
Company	Types of biofuel	Raw material	Generation	Activity	Added value
ABENGOA BIOENERGÍA	Biodiesel	Oils	1st	Industrial production	Production process optimised for Biodiesel production
ABENGOA BIOENERGÍA	Bioethanol	Lignocellulosic material, MSW	2nd	Industrial Production	Flagship facility for commercial exploitation of 2G Bioethanol starting up
ABENGOA BIOENERGÍA	Bioethanol	Cereal, sugarcane	1st	Industrial production	Improvement of yields over initial sugars together with high process profitability
ALGAENERGY	Biomass, biodiesel, bioethanol, biogas	Microalgae & cyanobacteria	3rd	Laboratory production & genetic engineering	Higher yield than 1st generation: No conflict with human food, use of non agricultural land, grow on either wastewater, brackish water or seawater, daily harvesting
BANCO ESPAÑOL DE ALGAS	Biomass, biodiesel, bioethanol, biogas	Microalgae, cyanobacteria (marine, freshwater, brackish and hypersaline environments)	3rd	Fast growing strains, isolation of new species, selection of strains	New biodiversity & cultivation systems, extremophiles, new techniques, connection with pilot plant units at real conditions, and R&D groups
BIOPOLIS	Biodiesel, bioethanol, biogas	Fermentative biomass microorganisms	2nd	Development of optimised microorganisms for biofuels	Process optimisation
Camelina Company España	Biojetfuel for the aviation industry	Camelina oil	2nd-3rd	Feedstock production	Sustainability. Drop in fuels
Camelina Company España	Liquid biofuel	Camelina oil	2nd	Sustainable feedstock	Sustainable feedstock for 2nd generation liquid biofuel. Biodiesel
Camelina Company España	Liquid biofuel	Camelina oil	2nd	Sustainable feedstock	Sustainable feedstock for 2nd generation liquid biofuel. Development for aviation liquid biofuel: biojetfuel
EntreChem	Biogas	Organic waste	1st	Microbial population analysis	Identification of key microorganisms in anaerobic digesters to drive performance optimisation
Fundación Parque Científico Tecnológico Aula Dei	Biodiesel	Oil from non-food crop	3rd	Sustainable feedstock	Sustainable feedstock for 2nd generation liquid biofuel
GAIKER - IK4	All	All	1st-2nd	Life Cycle Analysis and Life Cycle Costing	New tool for the environmental and social evaluation of biofuels
GAIKER - IK4	Biodiesel	Microseaweeds	2nd	Development of the complete process: from microseaweed selection to biodiesel production	Pilot plant facilities for the microseaweed culture, filtration, extraction and production of biodiesel
GAIKER - IK4	Biodiesel	Animal processing fats	2nd	Process improvement	Versatile pilot plant facility
GAIKER - IK4	Biodiesel	Oils	1st-2nd	Process improvement, development and testing of new reactions	Versatile pilot plant facility
Ingeniatrics Tecnologias	All	Emissions	1st	Treatment of NOx Emissions	Diminishes NOx emissions utilising urea with improved efficiency
Ingeniatrics Tecnologias	All	Fuel Delivery	1st	Optimised fuel atomization	Diminishes emissions - gas and solid particles, makes combustion more efficiently. Capacity to make viscous materials burn, e.g. glycerine
INKEMIA IUCT group	Synthesis and purification of biofuels either by chemical or biotechnological routes	All	1st-2nd	Process optimisation of biofuel production	One stop shop for biofuel process optimisation
INKEMIA IUCT group	Heating	Glycerol and other	2nd	New biofuel for heating in industrial furnaces	100% biomass use. Substitutes fuel oils. Economically viable. Does not need preheating of the fuel oils for ignition
INKEMIA IUCT group	Biofuels for S-50 diesel engines	Glycerol	2nd	Development of new biofuels and other biotech products	100% of biomass (oil) use, as it converts glycerine into a biofuel with improved properties compared to famers
LEITAT	Biodiesel	Oils	1st-2nd	Transesterification process development	Recovery of oily waste. More sustainable process
LEITAT	Electricity	Organic effluents (wastewater)	2nd	Microbial Fuel Cell. Semi-pilot scale-up	Obtaining energy from organic waste effluent. Process optimisation
LEITAT	Bioethanol	Biomass	2nd	Pretreatment of raw material	Improvement of the saccharification efficiency by chemical or enzymatic pathways
LEITAT	Cogeneration/Heating	Biomass	2nd	Energy studies	Study the technical feasibility of the power source
LEITAT	Biogas	Organic waste such as olive mill waste and pig manure	2nd	Pilot plant demonstration	Process optimised. Valorisation of a waste with limited valorisation options. Pre-treatment optimisation
LEITAT	All	All	1st-2nd	LCA	Quantification of the environmental improvements and sustainability of different processes of energy production and biofuels
NEIKER	Gas heating	Biomass	2nd	Improvement of biomass production systems	Reduced costs of intensive agricultural production systems: energy efficiency of production processes
NEIKER	Cogeneration	Organic waste	2nd	Nutrients removal	Increased profitability of processes through a combination of different organic sources
NEIKER	Cogeneration	Organic waste	2nd	Digestate Treatment	Technical feasibility study of digestate in agriculture
NEIKER	Biogas	Microalgae	2nd	Biomass production	Technical feasibility study of the power source
NEIKER	Biogas	Organic waste	2nd	Biomethanisation process improvement	Recycling organic wastes to generate methane processes
NEIKER	Diesel	Crops	1st	Exploitation and valorisation of by-products	Integrated utilisation of biomass: energy and animal feed
NEIKER	Diesel	Crops	1st	Crop agronomy	Improvement of farm profitability
NEIKER	Diesel	Microalgae	2nd	Biomass production	Significant yield increase in the production of biomass
NEIKER	Diesel	Microalgae	2nd	Strains selection	Improving farm profitability
NEIKER	Diesel	Microalgae	2nd	Genetic transformation	Process profitability increase: mixed use algae
NEOL BIOSOLUTIONS	Biodiesel, renewable diesel	Raw glycerine; lignocellulose biomass	2nd-3rd	Development of technology	Valorisation of by-products. Non-competition with food raw materials. High yield production of microbial oils
PIONEER HI-BRED	Biogas	Fermentative biomass bacteria	2nd	Development of specific strains	Strains of Bacillus spp. With a high generation capacity of lactic acid for the preservation of forage and cell lysis capacity for a more effective capacity in anaerobic digestion
PIONEER HI-BRED	Biogas	Crops (Corn and Sorghum)	1st	Development of improved varieties	Hybrids of maize and sorghum forage with high production capacity of dry matter per unit surface area adapted to specific agricultural conditions in Spain
PIONEER HI-BRED	Biomass	Crops (Corn and Sorghum)	1st	Development of improved varieties	Hybrids of maize and sorghum forage with high production capacity of dry matter per unit surface area adapted to specific agricultural conditions in Spain
PIONEER HI-BRED	Bioethanol	Crops (Corn and Sorghum)	1st	Development of improved varieties	Corn hybrids with higher starch content and extractable per unit area production adapted to specific agricultural conditions in Spain
PIONEER HI-BRED	Biodiesel	Oil Crops (Sunflower and Rape)	1st	Development of improved varieties	Sunflower and rapeseed hybrids with higher levels of fatty acids and yield per unit area, adapted to specific agricultural conditions in Spain
REPSOL	Advanced biofuels	Lignocellulose and other waste carbon sources	2nd	Development of microorganisms with new synthetic pathways and optimisation of biofuel production	Synthetic biology approach for new biofuel precursor molecules production

*Based on data provided by ASEBIO associated companies. MAY 2015.

Spanish White Biotech Pipeline 2015

An overview of industrial biotechnology projects currently developed by the Spanish biotech industry

TECHNOLOGIES



ASEBIO, the Spanish Bioindustry Association, encompasses over 280 firms, associations, foundations, universities, technology and research centers which carry out activities directly or indirectly related to biotechnology.

The wide number of associates makes **ASEBIO** the most appropriate meeting platform to face up the challenges of developing the biotechnology sector in Spain.

Around 550 companies research and develop products in the Spanish biotechnology sector.

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