

# Spanish White Biotech Pipeline\*

## BIOPRODUCTS

Company	Name	Indication	Basic R&D	Applied R&D	Ready for exploitation	Industrial scale up	Available	Technology transfer in process	Patent
ABENGOA BIOENERGÍA	ABENGOA BIOENERGÍA	DDGS (Dried Distillers Grains with Solubles)	✓	✓	✓	✓	✓	✓	✓
ABENGOA BIOENERGÍA	ABENGOA BIOENERGÍA	Sugars	✓	✓	✓	✓	✓	✓	✓
ABENGOA BIOENERGÍA	ABENGOA BIOENERGÍA	Microalgae collection	✓	✓	✓	✓	✓	✓	✓
ALGAENERGY	ALGAENERGY	Microalgae products with excellent properties for several applications and sectors	✓	✓	✓	✓	✓	✓	✓
Bioibérica	Terra-Sorb	Biostimulant	✓	✓	✓	✓	✓	✓	✓
Bioibérica	Inicium	Biostimulant	✓	✓	✓	✓	✓	✓	✓
Bioibérica	StressSal	Biostimulant	✓	✓	✓	✓	✓	✓	✓
Bioibérica	Terramin	Biostimulant	✓	✓	✓	✓	✓	✓	✓
Bioibérica	Terra Humic	Biostimulant	✓	✓	✓	✓	✓	✓	✓
Bioibérica	AminoQuelant	Bioavailable Nutrition	✓	✓	✓	✓	✓	✓	✓
Bioibérica	Optimum	Plant protection (resistance to biotic stress)	✓	✓	✓	✓	✓	✓	✓
Bioibérica	Armurox	Plant protection (endogenous defense mechanisms)	✓	✓	✓	✓	✓	✓	✓
Bioibérica	Cera Trap	Biological Attractants	✓	✓	✓	✓	✓	✓	✓
Bioibérica	Dacus Trap	Biological Attractants	✓	✓	✓	✓	✓	✓	✓
Bioibérica	Mosca Trap	Biological Attractants	✓	✓	✓	✓	✓	✓	✓
Bioibérica	Suzukii Trap	Biological Attractants	✓	✓	✓	✓	✓	✓	✓
Bioibérica	Flyral	Biological Attractants	✓	✓	✓	✓	✓	✓	✓
Bioibérica	Biocebo	Biological Attractants	✓	✓	✓	✓	✓	✓	✓
Biomedal	rProtein A (4x2)	Synthetic derivative produced by recombinant expression. Antibody purification	✓	✓	✓	✓	✓	✓	✓
Biomedal	rProtein G (3x3)	Synthetic derivative produced by recombinant expression. Antibody purification	✓	✓	✓	✓	✓	✓	✓
Biomedal	ProPure rProtein A FastCap	Immunoglobulin capture and purification cartridges	✓	✓	✓	✓	✓	✓	✓
Biomedal	ProPure rProtein G FastCap	Immunoglobulin capture and purification cartridges	✓	✓	✓	✓	✓	✓	✓
Biomedal	ProPure rProtein A Rapid Flow	Immunoglobulin capture and purification affinity medium	✓	✓	✓	✓	✓	✓	✓
Biomedal	ProPure rProtein G Rapid Flow	Immunoglobulin capture and purification affinity medium	✓	✓	✓	✓	✓	✓	✓
Biomedal	ProPure rProtein A LCL Agarose	Immunoglobulin capture and purification affinity medium	✓	✓	✓	✓	✓	✓	✓
GAIKER - IK4	GAIKER - IK4	Antibacterial polymers and coatings and evaluation of biocide properties	✓	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	GC-S51	New solvent from renewable materials for synthesis of APIs	✓	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	CAT-Aquid / Bcpym / Hmudp	New catalyst pyrimidine phosphorilase nucleoside	✓	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	CAT-Bcum - Gbspum - Ssdead	New catalyst Purine Phosphorilase Nucleoside	✓	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	GC-BIO-DF / GC-BIO-F	2-deoxy-5-fluorouridine, 5-fluorouridine. Anticancer / Colon & Pancreas / Colon & Breast	✓	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	BIO-TFT	Trifluoromethyl / Antiviral (Ophthalmic) / Herpes Cornea	✓	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	GC-BIO-DAP / BIO-AP	2,6-diaminopurine dioxiriboside. Anticancer / 2,6-diaminopurine riboside. Antiviral. Anticancer	✓	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	GC-S79	Solvents from renewable materials for the biodiesel sector	✓	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	SOL-LAOC4 / GC-S77 / GC-DMA	New solvent from renewable materials for metal degreasing and for Paint and varnishes from DMA	✓	✓	✓	✓	✓	✓	✓
NANOIMMUNOTECH	NITZIPPER	Family of products ready to be easily, quickly and efficiently bioconjugated (antibodies, dyes, enzymes, micro / nanostructures, peptides, molecules, linkers, etc)	✓	✓	✓	✓	✓	✓	✓
PROTEOS BIOTECH	PROTEOS-RPROT	Recombinant proteins and growth factors	✓	✓	✓	✓	✓	✓	✓
PROTEOS BIOTECH	PROTEOS-PCAI	Personal care active ingredients and products	✓	✓	✓	✓	✓	✓	✓
PROTEOS BIOTECH	PBSerum	Enzymatic cosmetics	✓	✓	✓	✓	✓	✓	✓
ABENGOA BIOENERGÍA	ABENGOA BIOENERGÍA	Cellulolytic and Hemicellulolytic enzymes	✓	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	GC-S78	New solvent from renewable materials for Crop protection	✓	✓	✓	✓	✓	✓	✓
SYGNIS	SYGNIS BIOTECH S.L	QualiPhi (next-gen version of Phi 29 DNA polymerase)	✓	✓	✓	✓	✓	✓	✓
ABENGOA BIOENERGÍA	ABENGOA BIOENERGÍA	Microalgae collection	✓	✓	✓	✓	✓	✓	✓
Biomedal	rProtein A Resins	Immunoglobulin capture and purification	✓	✓	✓	✓	✓	✓	✓
Biomedal	nLZ4-Cys	Cost effective ligand for antibody purification	✓	✓	✓	✓	✓	✓	✓
NEOL BIOSOLUTIONS	NEOL BIOSOLUTIONS	Yeast biomass for different end markets. High protein content and vitamins	✓	✓	✓	✓	✓	✓	✓
NEOL BIOSOLUTIONS	NEOL BIOSOLUTIONS	9000 microorganism collection for different bio industrial processes	✓	✓	✓	✓	✓	✓	✓
Phytore Biotech	Phytore Biotech	Plant cell cultures for dermatological applications	✓	✓	✓	✓	✓	✓	✓
Fundación MEDINA	MEDiversity	Microbial Collections	✓	✓	✓	✓	✓	✓	✓
Fundación MEDINA	MEDgene	Microbial Genetic Bank	✓	✓	✓	✓	✓	✓	✓
SYGNIS	SYGNIS BIOTECH S.L	Synnis Biotech	✓	✓	✓	✓	✓	✓	✓
SYGNIS	SYGNIS BIOTECH S.L	Synnis Biotech	✓	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	Bio-EPS	New exopolysaccharides use as nutraceutical and cosmetics (8 compounds)	✓	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	CAT-Halo1 / Halo2	Enzymatic mixture with hydrolytic activity / with lipase and protease activity	✓	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	CAT-Halolip / Haloprot	New halolipase / New haloprotease	✓	✓	✓	✓	✓	✓	✓
NEOL BIOSOLUTIONS	NEOL BIOSOLUTIONS	Microbial triglycerides obtained from fermentation	✓	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	BIO-K3	Menadione (vitamin K3)	✓	✓	✓	✓	✓	✓	✓
ABENGOA BIOENERGÍA	ABENGOA BIOENERGÍA	n-butanol	✓	✓	✓	✓	✓	✓	✓
LEITAT	LEITAT	Protein hydrolysates	✓	✓	✓	✓	✓	✓	✓
REPSOL	REPSOL	New microalgae strain with high oil production	✓	✓	✓	✓	✓	✓	✓
REPSOL	REPSOL	Microorganisms for biofuel production	✓	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	BIO-CEM	New microorganisms for self healing concrete	✓	✓	✓	✓	✓	✓	✓
CIBER-BBN	CIBER-BBN	BBN-F1 a F4, Rare Diseases	✓	✓	✓	✓	✓	✓	✓
CIBER-BBN	CIBER-BBN	Biomaterial with metallic coating. Polymeric material. Bone regeneration	✓	✓	✓	✓	✓	✓	✓
CIBER-BBN	CIBER-BBN	Lipophilic derivatives siRNA. Modified siRNA. Gene therapy	✓	✓	✓	✓	✓	✓	✓
CIBER-BBN	CIBER-BBN	Targeted delivery carrier. Oncology	✓	✓	✓	✓	✓	✓	✓
LEITAT	LEITAT	Protein hydrolysates	✓	✓	✓	✓	✓	✓	✓

## TECHNOLOGIES

Company	Name	Indication	Basic R&D	Applied R&D	Ready for exploitation	Available	Technology transfer in process	Patent
ALGAENERGY	ALGAENERGY	Microalgae Production Technology for several applications	✓	✓	✓	✓	✓	✓
ALGAENERGY	ALGAENERGY	Microalgae production facilities, technologies, control and harvesting systems	✓	✓	✓	✓	✓	✓
BIOCHEMIZE	BIOCHEMIZE	Screening for microbial and enzymatic biocatalysis	✓	✓	✓	✓	✓	✓
BIOCHEMIZE	BIOCHEMIZE	Enzymatic screening for modification of chemical structures	✓	✓	✓	✓	✓	✓
BIOCHEMIZE	BIOCHEMIZE	Enzymatic technological platform for advanced esterification reactions	✓	✓	✓	✓	✓	✓
BIOCHEMIZE	BIOCHEMIZE	Enzymatic technological platform for advanced aldolic reactions	✓	✓	✓	✓	✓	✓
Biomedal	Biomedal	Bacterial expression system	✓	✓	✓	✓	✓	✓
BIOMOL-INFORMATICS	BIOMOL-INFORMATICS	In silico drug discovery through combinatorial quimioinformatics	✓	✓	✓	✓	✓	✓
Bionanopus	Bionanopus	Topical (skin and mucus) drug delivery technology using polymeric nanoparticles	✓	✓	✓	✓	✓	✓
Bionanopus	Bionanopus	Transungual drug delivery technology using polymeric nanoparticles	✓	✓	✓	✓	✓	✓
Bionanopus	Bionanopus	Topical Ophthalmic drug delivery technology using polymeric nanoparticles	✓	✓	✓	✓	✓	✓
Bionaturis	Bionaturis	Baculovirus expression system. MVB, WSVB, upstream development, downstream development, analytical development, scale-up	✓	✓	✓	✓	✓	✓
Bionaturis	Bionaturis	Recombinant expression of second generation vaccines (VLPs, chimeric, subunits)	✓	✓	✓	✓	✓	✓
BIONET	BIONET	Serial 35 L Bioreactor	✓	✓	✓	✓	✓	✓
BIONET	BIONET	Serial Membrane filtration units	✓	✓	✓	✓	✓	✓
BIONET	BIONET	Fermentation technologies	✓	✓	✓	✓	✓	✓
BIONET	BIONET	Membrane filtration technologies	✓	✓	✓	✓	✓	✓
BIONET	BIONET	Serial 5 L Bioreactor	✓	✓	✓	✓	✓	✓
BIONET	BIONET	Serial 350-1000 L Bioreactor	✓	✓	✓	✓	✓	✓
BIONET	BIONET	Serial CIP units	✓	✓	✓	✓	✓	✓
BIOFOLIS	BIOFOLIS	High added value compounds extraction	✓	✓	✓	✓	✓	✓
BIOFOLIS	BIOFOLIS	Recombinant protein expression for therapeutic and diagnostic application	✓	✓	✓	✓	✓	✓
BIOSEARCH	BIOSEARCH	Screenings for antimicrobial, antibiotic, inhibitory of cholesterol absorption activity	✓	✓	✓	✓	✓	✓
BIOSEARCH	BIOSEARCH	Pilot plant in main food applications. Preparation of dairy prototypes and other food matrices	✓	✓	✓	✓	✓	✓
BIOSEARCH	BIOSEARCH	Testing and Calibration laboratory accredited by ENAC according to ISO17025	✓	✓	✓	✓	✓	✓
CURAXYS	CURAXYS	Biosimilars monoclonal antibodies Platform	✓	✓	✓	✓	✓	✓
Fundación MEDINA	Fundación MEDINA	Bioactive Molecule Discovery Platform	✓	✓	✓	✓	✓	✓
Fundación MEDINA	Fundación MEDINA	Microbial Fermentation & Scale Up Platform	✓	✓	✓	✓	✓	✓
Fundación MEDINA	Fundación MEDINA	LCMS & NMR Analytical Platform	✓	✓	✓	✓	✓	✓
Fundación MEDINA	Fundación MEDINA	High Throughput Screening of Biotechnological Products	✓	✓	✓	✓	✓	✓
Fundación MEDINA	Fundación MEDINA	Bioanalysis mass spectrometry platform	✓	✓	✓	✓	✓	✓
FUNDACION PROGRESO Y SALUD (SAS)	FUNDACION PROGRESO Y SALUD (SAS)	Microplate Vacuum Washer	✓	✓	✓	✓	✓	✓
GADEA BIOPHARMA	GADEA BIOPHARMA	Sterile final pharmaceutical forms	✓	✓	✓	✓	✓	✓
GAIKER - IK4	GAIKER - IK4	Active packaging	✓	✓	✓	✓	✓	✓
GAIKER - IK4	GAIKER - IK4	Microencapsulation of bioactive substances, active ingredients, and essential oils	✓	✓	✓	✓	✓	✓
GAIKER - IK4	GAIKER - IK4	Incorporation of active substances in textile fibers	✓	✓	✓	✓	✓	✓
GAIKER - IK4	GAIKER - IK4	CO2 Supercritical	✓	✓	✓	✓	✓	✓
GAIKER - IK4	GAIKER - IK4	Spray-drying	✓	✓	✓	✓	✓	✓
GAIKER - IK4	GAIKER - IK4	Pyrolysis	✓	✓	✓	✓	✓	✓
GAIKER - IK4	GAIKER - IK4	Photobioreactor	✓	✓	✓	✓	✓	✓
FUNDACION PROGRESO Y SALUD (GENVO)	FUNDACION PROGRESO Y SALUD (GENVO)	Lentiviral System for the generation of High Producing Clones (Protein Production)	✓	✓	✓	✓	✓	✓
INGENIATRICS	INGENIATRICS	Flow Focusing®	✓	✓	✓	✓	✓	✓
INGENIATRICS	INGENIATRICS	Flow Blurring®	✓	✓	✓	✓	✓	✓
INGENIATRICS	INGENIATRICS	Highly efficient spray of extremely fine droplets production	✓	✓	✓	✓	✓	✓
INGENIATRICS	INGENIATRICS	Microparticles Manufacturing	✓	✓	✓	✓	✓	✓
INGENIATRICS	INGENIATRICS	Tailored in-plant scaled-up manufacturing	✓	✓	✓	✓	✓	✓
INGENIATRICS	INGENIATRICS	Improved sensitivity and robustness analytic nebulizer and micronebulizer for spectrometry systems	✓	✓	✓	✓	✓	✓
INGENIATRICS	INGENIATRICS	High throughput nebulizer for material process: drying, pulverisation, etc. Able to operate with highly viscous materials	✓	✓	✓	✓	✓	✓
INGENIATRICS	INGENIATRICS	User-friendly bioencapsulation portable platform to encapsulate high molecular weight compounds, microorganisms and cells	✓	✓	✓	✓	✓	✓
INGENIATRICS	INGENIATRICS	Brand-new spray-drying and spray-chilling equipment integrating proprietary technology emitters for highly accurate and efficient microparticles production	✓	✓	✓	✓	✓	✓
INGENIATRICS	INGENIATRICS	Customised CRO microencapsulation services for cosmetics, chemicals, consumer goods, including SPHERES, CORE-SHELL and DOUBLE SHELL structure	✓	✓	✓	✓	✓	✓
INGENIATRICS	INGENIATRICS	Development and manufacturing of proprietary technology nebulizers, atomisers, and equipment or devices including it / coating systems	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	INKEMIA IUCT GROUP	Substitution for green safer solvent from renewable resources in different industrial applications	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	INKEMIA IUCT GROUP	Molecular biology: genetically modified microorganism	✓	✓	✓	✓	✓	✓
INKEMIA IUCT GROUP	INKEMIA IUCT GROUP	High throughput biotechnological synthesis of small molecules	✓	✓	✓	✓	✓	✓
Laboratorios LETI	Laboratorios LETI	Protein Purification	✓	✓	✓	✓	✓	✓
Life Length	Life Length	Telomere measurement	✓	✓	✓	✓	✓	✓
Lonza	Lonza	Stirred bioreactors 5.000 & 10.000 L. scale & single-use bioreactors	✓	✓	✓	✓	✓	✓
Lonza	Lonza	Custom manufacturing of monoclonal antibodies and recombinant proteins using mammalian cell culture	✓	✓	✓	✓	✓	✓
Lonza	Lonza	Analytical Services for the Biotechnology Industry	✓	✓	✓	✓	✓	✓
NANOIMMUNOTECH	NANOIMMUNOTECH	Calorimetric biosensor	✓	✓	✓	✓	✓	✓
NANOIMMUNOTECH	NANOIMMUNOTECH	Thermal biosensor based on visual detection by colour change in a support where an analyte is present, produced by heat when irradiated with external light source	✓	✓	✓	✓	✓	✓
NEIKER	NEIKER	Protein purification	✓	✓	✓	✓	✓	✓
NEIKER	NEIKER	Development of microalgae culture strategies to obtain high lipid biomass content	✓	✓	✓	✓	✓	✓
Phytore Biotech	Phytore Biotech	Plant cell cultures technology for the development of dermocosmetic product	✓	✓	✓	✓	✓	✓
PROTEOS BIOTECH	PROTEOS BIOTECH	Protein Purification System	✓	✓	✓	✓	✓	✓
PROTEOS BIOTECH	PROTEOS BIOTECH	Microencapsulation of active ingredients and enzymes	✓	✓	✓	✓	✓	✓
PROTEOS BIOTECH	PRO							



# Spanish White Biotech Pipeline\*

## BIOPROCESSES

Company	Name	Indication	Basic R&D	Applied R&D	Ready for exploitation	Industrial scale up	Available	Technology transfer in process	Patent
3P BIOPHARMACEUTICALS	CMO GMP certified	Freedom-to-operate platform in Bacteria, yeast and mammalian	█	█	█	█	█		
3P BIOPHARMACEUTICALS	CMO GMP certified	Bioprocess Development/Optimisation Platform (USP/DSP)	█	█	█	█	█		
3P BIOPHARMACEUTICALS	CMO GMP certified	Analytics development and validation platform (API, IMP, IPC) for New biological entities	█	█	█	█	█		
3P BIOPHARMACEUTICALS	CMO GMP certified	Analytics development and validation platform (API, IMP, IPC) for Biosimilars	█	█	█	█	█		
BIOCHEMIZE	PB-est	Enzymatic and microbial platform for esterification of organic compounds	█	█	█	█	█		█
BIOCHEMIZE	PB-red	Enzymatic and microbial platform for reduction of oxygen functional groups	█	█	█	█	█		█
BIOCHEMIZE	PB-oxi	Enzymatic and microbial platform for oxidation of aromatic methylenes	█	█	█	█	█		█
BIOCHEMIZE	PB-met	Enzymatic and microbial platform for methylation of aromatic compounds	█	█	█	█	█		█
BIOCHEMIZE	PB-rac	Enzymatic and microbial platform for separation of racemic compounds	█	█	█	█	█		█
BIOCHEMIZE	PB-ald	Enzymatic and microbial platform for aldolic condensations	█	█	█	█	█		█
Biomedal	LYTAG-2nd-PHASE	Protein separation and purification	█	█	█	█	█		█
Biomedal	HISTAG-2nd-PHASE	Protein separation and purification of his-tagged proteins in aqueous two phase systems	█	█	█	█	█		█
Bionaturis	FLYLIFE	Baculovirus-based expression system at industrial scale (MVB, WVS, upstream, downstream)	█	█	█	█	█		█
BIONET		Process Development/Optimisation (USP and DSP)	█	█	█	█	█		█
BIONET		Scale up and GMP facilities design	█	█	█	█	█		█
BIOPOLIS	Bio-CI	Custom cloning and expression of recombinant protein	█	█	█	█	█		█
BIOPOLIS	Bio-Snt	Biosynthesis of chemical compounds	█	█	█	█	█		█
BIOPOLIS	Bio-BPL	Process development for biopolymers production	█	█	█	█	█		█
BIOPOLIS	Bio-CIi	Bioprocesses / biocatalysis	█	█	█	█	█		█
BIOSEARCH		Manufacture and Purification of plant extracts	█	█	█	█	█		█
Camelina Company España	Liquid biofuel	Camelina oil: Feedstock for Bio products (bioplastics, biolubricants, biopolymers, gondoic acid)	█	█	█	█	█		█
Curaxys		Upstream & Downstream process	█	█	█	█	█		█
GADEA BIOPHARMA		Biotechnological production of steroids	█	█	█	█	█		█
GADEA BIOPHARMA		Biotechnological production of APIs	█	█	█	█	█		█
GADEA BIOPHARMA		Scale up and production	█	█	█	█	█		█
GAIKER - IK4		Contaminated soils bioremediation	█	█	█	█	█		█
GAIKER - IK4		Biological treatments for water purification	█	█	█	█	█		█
GAIKER - IK4		Biopolymers development	█	█	█	█	█		█
GAIKER - IK4		Production in bioreactor of micro-algae (biodiesel and functional ingredients) and fermentation	█	█	█	█	█		█
Laboratorios LETI		Production of protein extracts / allergens	█	█	█	█	█		█
Lonza	Lonza Biologics Porriño	Analytical services and stability studies of DS and DP	█	█	█	█	█		█
PLASMA BIOTECH		Biocatalytic synthesis of nucleoside analogues	█	█	█	█	█		█
PRAXIS	Proteins & Peptides	Micro-nano-formulation, aseptic filling and freeze-drying	█	█	█	█	█		█
ALGAINERGY		Biomass integral valorisation process	█	█	█	█	█		█
Bionaturis	FLYPIDS	Recombinant expression of second generation vaccines (VLPs, chimeric, subunits)	█	█	█	█	█		█
BIOPOLIS	Bio-PHA	Process Development for PHA production	█	█	█	█	█		█
BIOPOLIS	Bio-Rp	Production and purification of recombinant proteins	█	█	█	█	█		█
BIOPOLIS	Bio-Bph	Production of biopharmaceuticals, key organic compounds and green chemicals	█	█	█	█	█		█
Fundación MEDINA		Fermentation of new fungal and bacterial strains with biotechnological applications	█	█	█	█	█		█
Fundación MEDINA		Isolation of new natural products from microbial fermentations	█	█	█	█	█		█
GADEA BIOPHARMA		Bacterial and fungal fermentation and DSP	█	█	█	█	█		█
GADEA BIOPHARMA		Aseptic lyophilisation and filling of APIs	█	█	█	█	█		█
GAIKER - IK4		Biodegradation	█	█	█	█	█		█
GAIKER - IK4		Bioremediation	█	█	█	█	█		█
GAIKER - IK4		Biofunctional nanoparticles synthesis	█	█	█	█	█		█
GAIKER - IK4		Fermentation. Production of microorganisms and recombinant proteins	█	█	█	█	█		█
INKEMIA IUCT GROUP	Bio-SRC	Prospection, isolation, characterisation and performance of new microorganisms in industrial biotechnology	█	█	█	█	█		█
INKEMIA IUCT GROUP	Bio-PROC	Substitution of chemical processes for bioprocesses	█	█	█	█	█		█
NEIKER		Production of Recombinant Proteins	█	█	█	█	█		█
NEIKER		Production of Omega-3-Rich Oil from microalgae	█	█	█	█	█		█
NEOL BIOSOLUTIONS	MICROBIOL	Production of single cell oils	█	█	█	█	█		█
PROTEOS BIOTECH	PROTEOS - BFERM	Bacterial fermentation	█	█	█	█	█		█
PROTEOS BIOTECH	PROTEOS - PEX	Protein expression systems	█	█	█	█	█		█
PROTEOS BIOTECH	PROTEOS - PRP	Production of Recombinant Proteins	█	█	█	█	█		█
ABENGOA BIOENERGÍA		Biochemical production of monomers from sugars	█	█	█	█	█		█
nanoMyP	Tiss Series	Synthesis of nanostructured tissues for biocatalytic processes	█	█	█	█	█		█
NEIKER		Production of carotenoids from microalgae	█	█	█	█	█		█
Phytore Biotech		Development of plant cell cultures as new cosmetic actives ingredients	█	█	█	█	█		█
PROTEOS BIOTECH	PROTEOS-PPMW	Proteolytic processes - meat waste	█	█	█	█	█		█
PROTEOS BIOTECH	PROTEOS-PPDA	Proteolytic processes - dairy applications	█	█	█	█	█		█
Biobérica		Biogas production plan project from fat	█	█	█	█	█		█
Curaxys		Manufacture and Purification of Recombinant Proteins (GMP)	█	█	█	█	█		█
Curaxys		Production of Monoclonal Antibodies (GMP)	█	█	█	█	█		█
LEITAT		Enzymatic protein hydrolysis processes	█	█	█	█	█		█
LEITAT		Biogas production from waste and effluents	█	█	█	█	█		█
LEITAT		Bioisofactor production processes from commercial and renewable feedstock	█	█	█	█	█		█
LEITAT		Biotechnological cotton process	█	█	█	█	█		█
NEOL BIOSOLUTIONS		Omega 3 bioprocess	█	█	█	█	█		█
ABENGOA BIOENERGÍA		Catalytic synthesis of n-butanol from ethanol	█	█	█	█	█		█
Neuron Bio	NST-Pkt	Biosynthesis of new polyketides derivatives	█	█	█	█	█		█
Phytore Biotech		Development of plant cell cultures for dermatologic pathologies	█	█	█	█	█		█
LEITAT		Bioprocess for textile processing	█	█	█	█	█		█
LEITAT		Substitution of chemical processes by bioprocesses	█	█	█	█	█		█
LEITAT		Enzymatic improvement of fats and fat valorisation	█	█	█	█	█		█
LEITAT		Obtaining of protein hydrolysates	█	█	█	█	█		█
PROTEOS BIOTECH	PROTEOS-PPDET	Proteolytic processes - detergents applications	█	█	█	█	█		█
PROTEOS BIOTECH	PROTEOS-BPEFA	Biocatalysis processes - Essential fatty acids	█	█	█	█	█		█
PROTEOS BIOTECH	PROTEOS-MBP	Microbial biogas production	█	█	█	█	█		█
PROTEOS BIOTECH	PROTEOS-BS	Production of Biosimilars	█	█	█	█	█		█
LEITAT		Enzymatic synthesis of prebiotic ingredients	█	█	█	█	█		█
GAIKER - IK4		Development of soil remediation process based on nanoparticles	█	█	█	█	█		█
Phytore Biotech		Recombinant proteins production through plant cell cultures platform	█	█	█	█	█		█

## BIOFUELS

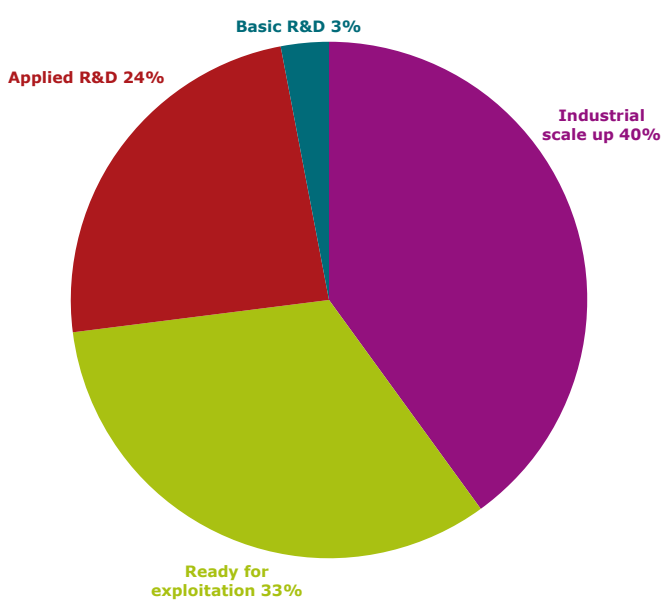
Company	Types of Biofuels	Raw material	First (1st), second (2nd) or third (3rd) generation	Activity	Added value
ABENGOA BIOENERGÍA	Bioethanol	Cereal, sugarcane	1st	Industrial production	Improvement of yields over initial sugars together with high process profitability
ABENGOA BIOENERGÍA	Bioethanol	Lignocellulosic material, MSW	2nd	Development of technologies for industrial production	Flagship facility for commercial exploitation of 2G Bioethanol under construction
ABENGOA BIOENERGÍA	Biodiesel	Oils	1st	Industrial production	Production process optimised for Biodiesel production
ALGAINERGY	Biomass, biodiesel, bioethanol, biogas	Microalgae & cyanobacteria	2nd	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
BIONET	Biodiesel, bioethanol, biogas, H2	Fermentative biomass microorganisms	2nd 3rd	Equipment supply	Engineering services, equipment supply and turn key project
BIOPOLIS	Biodiesel, bioethanol, biogas	Fermentative biomass microorganisms	2nd	Development of optimised microorganisms for biofuels	Process optimisation
Camelina Company España	Liquid biofuel	Camelina oil	2nd	Sustainable feedstock	Sustainable feedstock for 2nd generation liquid biofuel. Development for aviation liquid biofuel: biogjetfuel
Camelina Company España	Liquid biofuel	Camelina oil	2nd	Sustainable feedstock	Sustainable feedstock for 2nd generation liquid biofuel. Biodiesel
EntreChem	Biogas	Organic waste	1st	Microbial population analysis	Identification of key microorganisms in anaerobic digesters to drive performance optimisation
GAIKER - IK4	Biodiesel	Oils	1st and 2nd	Process improvement, development and testing of new reactions	Versatile pilot plant facility
GAIKER - IK4	Biodiesel	Animal processing fats	2nd	Process improvement	Versatile pilot plant facility
GAIKER - IK4	Biodiesel	Microseeds	2nd	Development of the complete process: from microseed selection to biodiesel production	Pilot plant facilities for the microseed culture, filtration, extraction and production of biodiesel
GAIKER - IK4	All	All	1st and 2nd	Life Cycle Analysis and Life Cycle Costing	New tool for the environmental and social evaluation of biofuels
INGENIATRICS	All	Fuel Delivery		Optimised fuel atomization	Diminishes emissions - gas and solid particles, makes combustion more efficiently. Capacity to make viscous materials burn, e.g. glycerine
INGENIATRICS	All	Emissions		Treatment of NOx Emissions	Diminishes NOx emissions utilising urea with improved efficiency
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 farmers
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	Synthesis and purification of biofuels either by chemical or biotechnological routes	All	1st and 2nd	Process optimisation of biofuel production	One stop shop for biofuel process optimization
LEITAT	All	All	1st and 2nd	LCA	Quantification of the environmental improvements and sustainability of different processes of energy production and biofuels
LEITAT	Biogas	Organic waste	2nd	Process development	Process optimisation
LEITAT	Cogeneration/Heating	Biomass	2nd	Energy studies	Study the technical feasibility of the power source
LEITAT	Bioethanol	Biomass	2nd	Pre-treatment of raw material	Improvement of the saccharification efficiency by chemical or enzymatic pathways
LEITAT	Electricity	Organic effluents	2nd	Microbial Fuel Cells development	Obtaining energy from organic waste effluents
LEITAT	Biodiesel	Oils	1st and 2nd	Transesterification process development	Recovery of oily waste. More sustainable process
NEIKER	Diesel	Microalgae	2nd	Genetic transformation	Process profitability increase: mixed use algae
NEIKER	Diesel	Microalgae	2nd	Strains selection	Improving farm profitability
NEIKER	Diesel	Microalgae	2nd	Biomass production	Significant yield increase in the production of biomass
NEIKER	Diesel	Crops	1st	Crop agronomy	Improvement of farm profitability
NEIKER	Diesel	Crops	1st	Exploitation and valorisation of by-products	Integrated utilisation of biomass: energy and animal feed
NEIKER	Biogas	Organic waste	2nd	Biomechanisation process improvement	Recycling organic wastes to generate methane processes
NEIKER	Biogas	Microalgae	2nd	Biomass production	Technical feasibility study of the power source
NEIKER	Cogeneration	Organic waste	2nd	Digestate Treatment	Technical feasibility study of digestate in agriculture
NEIKER	Cogeneration	Organic waste	2nd	Nutrients removal	Increased profitability of processes through a combination of different organic sources
NEIKER	Gas heating	Biomass	2nd	Improvement of biomass production systems	Reduced costs of intensive agricultural production systems: energy efficiency of production processes
Neol BioSolutions	Biofuels, oils, biomass, biogas	Raw glycerine, lignocellulose biomass	2nd	MicroBIO® (Production of renewable biofuels)	Valorisation of by-products. High yield production of single cell oils
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
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	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	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	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
REPSOL	Biofuels	Microalgae	3rd	Development of technologies for industrial production	Improvement of the culture and downstream processes. Viability of the production.
REPSOL	Biofuels	Lignocellulosic material	2nd	Development of microorganisms and optimisation of biofuel production	Synthetic biology approach for new biofuel precursor molecules production

\*Based on data provided by ASEBIO associated companies. APRIL 2014.



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### BIOPROCESSES



### Spanish Biotechnology Association



www.asebio.com

ASEBIO, the Spanish Biotechnology Association, encompasses over 270 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 620 companies research and develop products in the Spanish biotechnology sector.