

**H2020: Sustainable Process Industries (SPIRE)**

**SPIRE 03-2016: Industrial technologies for the valorisation of European bio-resources into high added value process streams**

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1. **Organization main figures**

**ainia techological center** ([www.ainia.es](http://www.ainia.es)) is a technological research centre focused in the agro-food sector with more than 900 associated companies with the mission to promote research and technological development. Main figures are listed below:

* + 911 associated companies
  + 1227 clients
  + €15, 5 million in revenue
  + 194 professionals on staff
  + 19 patents
  + 230 R&D&I projects
  + 650 technical assistance operations / 283 companies
  + 93,000 analytical trials/ 500 companies
  + 21,000 active consumers
  + 1,830 hours of training given/579 companies
  + 22 International assistances/ seminars

ainia is a technology centre with the legal status of a private non-profit association, created in 1987 and formed by more than 900 companies mainly from the food sector.

Accredited with number 3 in the Register of Centres of lnnovation and Technology of Spain, ainia has a clear global vocation oriented to give an effective response to business needs. ainia belongs to the Spanish Federation of Technology Centres (FEDIT), the Network of Technological lnstitutes of the Valencian Community (REDIT), to the European Food lnstitutes (EFI), as well as numerous entities and associations, and has signed agreements with national and intemational organisations.

At the end of 2011, we had 911 member companies and 1227 customers. Thanks to the continued support of all these companies, associations and organisations, our centre currently has a wide customer base across the food industry. We also have a growing presence in other industries, such as the pharmaceuticals, cosmetic, chemical, packaging and logistics industries.

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1. **Research and innovation activities**

**Technological Areas**

**Biotechnology**

* Biological diagnosis means of molecular and biochemical tools
* Development of potentially useful active compounds for food and related products
* Industrial production of microalgae
* Evaluation of bioactivity by means of “in vitro” systems
* Environmental Improvement by means of biomethanization processes, biodegradation and advanced biological depuration

**Nanotechnology**

* Development of new packaging materials with functional nanoparticles
* Nanotechnology applied to the development of functional food: nano-encapsulation, molecular development of antibodies, nano-vectors of active principles and other technologies.

**Food Technology**

* Development of new products: prepared food, ready meals, functional food, other trends
* Transformation and reformulation of food
* Food preservation and processing technologies
* Food packaging
* Hygienic design of equipment and new for cleaning and disinfecting technologies

**Chemical technologies**

* Supercritical Fluid Technology
* Chemical Engineering operations
* Physical and chemical Analytical Technologies
* Advanced Oxidation

**Electronics and Communications**

* Fast techniques for quality control: infrared spectroscopy, hyperspectral imaging, ultrasounds and others
* Information Management Systems: interoperability, artificial intelligence, etc.

**Environmental and energetic technologies**

* Water and wastewater technologies.
* Ozone and other oxidizing agents used in cleaning operations
* Bioenergy: biogas, alternative biomass for anaerobic digestion, biomethane, biohydrogen, biological fuel cells
* Clean technologies. Best Available Techniques (BATs), Energy Efficiency and LCA (Life Cycle Analysis).

**Industrial Applications**

**Food and Health**

* Ingredients bioactivity
* Food reformulation to improve its effect of health
* Immunonutrition
* Food antioxidant capacity (ORAC)
* Functional foods

**Food Quality and safety**

* Development of fast techniques for microorganism detection
* Predictive microbiology
* Detection of adulteration of food using isotopic techniques
* Food traceability
* Analysis of optical, accoustic and radiofrequency signals
* Measurement of food safety parameters: foreing bodies, pesticides, etc.
* Food-package interaction
* Disinfection and enzymatic inactivation techniques

**Industrial design and production**

* Products obtained through biotecnological processes
* Design of elements for biotechnological production
* Edible coating
* Packaging design
* Development of functional materials for food packaging
* Extraction technologies
* Microencapsulation, Nanoencapsulation

**Sustainability**

* Biomethanization of agri-food waste
* Sustainable cleaning and disinfection of facilities
* Effluent treatment using advanced oxidation
* Minimization of packaging waste
* Life-cycle analysis

1. **Activities and future ambitions in the Biobased Economy**

The ainia´s activities and future ambitions have been divided into 3 areas:

A. Biomass & Waste,

B. Biorefineries, and

C. Products, Markets and Polices.

**A. BIOMASS and WASTE.**

**1. AGRO-WASTE.**

Activities:

ainia has developed an agro-waste database (at installation scale) which includes 180 subcategories of different agro-wastes (i.e. food and beverage industry organic wastes, animal manure, agricultural waste and biofuel production waste) in 330 agricultural areas of Spain. PROBIOGAS Project (MICINN, 2007-2011; [www.probiogas.es](http://www.probiogas.es)). This information was used by the Spanish Ministry of Industry for designing the 2011-2020 Renewable Energy Plan. An Internet-based tool called METANIZA developed by ainia and Ciemat incorporates this agro-waste database and allow technical, economical, environmental, CO2 and energy balances for running feasibility studies on biogas, biomethane and digestates from agro-waste. In the other hand, ainia has experience in studying the most suitable way to upgrade agro-waste byproducts to obtain high-added substances by means of extractive methods or biofermentative transformations. As an example, ainia took part in the European Project BIOACTIVE-NET, lead by TTZ, focusing on this issues regarding three of the most relevant agricultural cultivars at European Scale: tomato, olive and grape.

Finally, ainia is working in promoting the use of agro-waste by-products as a feedstock to obtain high-added value bio-products in a sustainable and technical-economic feasible way, as a part of biorefinery processing chain. Ainia is currently taking part in the project “CLAMBER: Castilla-La Mancha Bio-Economy Region” (MINECO-IVICAM, 2015,; <http://clamber.castillalamancha.es/> ) developing the integral valorization of cattle manure, wastewater sludge and winery wastes.

Future ambitions:

To incorporate new data in the agro-waste database (i.e. energy crops, new biomasses, …) and contribute to evaluate the bio refineries potential in Spain and EU. To transform METANIZA into a feasibility tool for biorefineries: adding biomass sources, new bioprocesses and products, etc.. To apply the high lab capacities to characterise new biomass and waste under the frame of biorefineries projects.

**2. LIGNOCELULOSIC FEEDSTOCK**

Activities:

Ainia has developed a number of projects related with the production and sustainable use of lignocelulosic feedstock: RICESTRAW. Use of pre-treated rice straw in co-digestion with cattle manure. A model for its sustainable use is available. AGROBIOMET. Use of straw and other lignocelulosic feedstock (crop wastes) to be co-digested with animal manure to obtain Biogas and Biomethane for vehicles. First vehicle run by agro biogas in Spain. (MICINN, 2010-2013; [www.agrobiomet.es](http://www.agrobiomet.es)). BIOMAN (FP7-SME-2012; 2011-2014; <http://bioman.dti.dk>), in which are studying the combination of different pre-treatment (physical and enzymatic) to increase the biogas production of the lignocelulosic feedstock (manure fibres and straw), and therefore increase the economic feasibility of the biogas plants fed with this type of wastes. LIFE SOSTRICE - CO2 (LIFE13 ENV/ES/001333; 2013-Nowadays; <http://www.sostrice.eu/en/>) Emission Reduction of the Rice Cultivation Through Energy Valorisation of the Rice Straw .

Future ambitions:

ainia is interested in demonstrating projects to validate the potential of agro lignocelulosic waste to produce bioenergy, biofuels and valuable compounds throught new technologies. Special interest for researching on pre-treatment technologies to achieve more biodegradable materials: thermo-chemical and/or bioprocesses.

**3. ENERGY CROPS.**

Activities:

Ainia has developed an applied research project on the potential of “Opuntia Ficus” as a non-food energy crop for biorefineries. This plant shows many advantages in water stressed areas like those existing in South Europe (PROBIOGAS (MICINN, 2007-2011)).

Future ambitions:

To progress on the Opuntia Ficus research on both production (varieties, cultivation, improving quality and yields,..) and conversion into biofuel, bioenergy and biobased products through anaerobic digestion or other bioprocesses.

**4. ALGAE.**

Activities:

Development of process stages (upstream, downstream, to produce microalgae biomass as a new source for bioproducts; upgrading by-products (agro-wastes, agro-food by products, gaseous streams, etc.) as substrates for generation of microalgae microalgae-derived bio-products; stabilization of microalgae biomass and derived products for latter uses; extraction of microalgae metabolites; scale-up of microalgae production processes; design and construction of specific facilities for microalgae production (BIOMAQUA, (MITYC, 2007-2009), CENIT VIDA, EXTRASUPER (INNPACTO 2010). Ainia has developed demonstration projects on microalgae for energetic (biogas) and environmental applications (waste CO2 containing gas and liquid streams treatment). Improvements achieved include: synergies between microalgae and biogas as (profiting nutrients from digestate, profiting CO2 from biogas combustion for microalgae cultivation or profiting microalgae biomass digestion for improving co-digestion). (BIOMAQUA, (MITYC, 2007-2009). Life Cycle Assessment software tools were used for evaluating strategies and scenarios for improving economic and environmental sustainability. In addition, ainia has designed its own photobioreactors specially proposed for increasing microalgalgae productivity by enhancing light availability in cultures (CENIT VIDA (CDTI 2010-2014).

Future ambitions:

ainia is interested in: promoting the use of microalgae as a renewable feedstock for current and new bio-products within biorefinery processes; developing more efficient microalgae bioproduction processes, surpassing current technical constraints of microalgae cultivation steps (cultivation productivity using low-cost substrates and by-products, harvesting, nutrients recycling, etc.); application of GRAS extraction technologies for microalgae bioproducts aiming for a sustainable and green microalgae biorefinery concept. ainia is interested in developing new low cost and high efficient open based photobioreactors as well as advanced harvesting systems to reduce the cultivation costs for energetic and environmental applications integrated in biorefinery concepts.

**B. BIOREFINERIES.**

**5. ANAEROBIC DIGESTION.**

PROBIOGAS 2007-2012 (www.probiogas.es) leaded by ainia has been the project of reference for the anaerobic digestion of agro-food waste in Spain. Probiogas is a public-private partnership of 28 partners (50% industries and 50% research centers) and had 14 subprojects varying from evaluation of feedstocks for AD, anaerobic digestion optimisation (co-digestion), and a number of demonstration projects including 0.5MWe biogas plants and industrial digestate to high value biofertilisers systems. Ainia has also leaded the 2013 BEST LIFE+ awarded project INTEGRAL-B (www.¡ntegral-b.com) for combined biodiesel and biogas from kitchen waste from restaurants, catering services and hotels. Main areas of AD research are: development of new pre-treatments, microbiological characterization of the anaerobic fermentation by means of molecular biological tools (PCR/DGGE), validation of new substrates, reduction of biological risks, control and modelling of the anaerobic process. Ainia has available a highly qualified pilot infrastructure for anaerobic digestion research. ainia has a biomethanitation unit (UBIMET-C36) composed by 15 pilot biodigesters to carry out tests for evaluating biogas productivity and composition, optimal substrates mixture, best operational parameters (organic loading rate and hydraulic retention time) and quality of the digestate. ainia has a biometanitation unit (UBIMET-B2) composed by 72 biodigesters to carry out maximum biogas potential tests (MBP) by means of the VDI 4630 standard. Monitoring of the anaerobic digestion process: Determination of the most important parameters related with the biological process of the anaerobic digestion (total and volatile solids, ammonium nitrogen concentration, volatile fatty acids profile, microbiological analysis, etc.). Ainia has contributed in the design of biogas plants: conceptual solution design, multidisciplinary approach and integral character (energy, environmental, agriculture), indications of sustainability, economic viability analysis. Moreover, the ainia labs are able to determinate the majority of the analytical parameters to control the anaerobic digestion process. Ainia has trained on anaerobic digestion through its basic and advanced biogas courses.

Ainia is currently developing a biotechnological system for the treatment of water, waste and effluents generated in the farms using “dark” anaerobic digestion bioprocesses to produce biohydrogen from cattle manure. This service is offered trough a public tender promoted by the prestigious Spanish CSIC (Consejo Superior de Investigaciones Cientificas)

Future ambitions:

Integration anaerobic digestion in biorefinery concepts. Develping new biomass pretreatments through enzymes or selected microorganisms, as well as thermo-chemical techniques to improve substrates biodegradability. Research on anaerobic digestion in two phases: optimization of the anaerobic digestion parameters in two phases to maximize the biogas production and the organic matter removal.

**6. BIOPRODUCTION OF HIGH ADDED VALUE COMPOUNDS**

Activities:

Obtention of valuable susbtances for human uses (food, cosmetics, pharmaceutics) or animal ones (feed) through bioproductive processes; transformation of low-cost substrates or by-products into valuable substances for human purposes; Scaling-up of bioproduction processes to define techno-economically feasible process for industrial purposes; Recovery and recycling of valuable components for other uses within integrated biorefinery concept.

Ainia has developed a number of projects related with the bioproduction of high added value compounds e.g. PHBOTTLE (FP7/2007-2013 / 280831) .New sustainable, functionalized and competitive PHB material based in fruit by-products getting advanced solutions for packaging and nonpackaging applications. Project ‘Castilla-la-mancha bioeconomy-region’ (CLAMBER). Ainia is currently developing three innovative bioproductive processes for the integral valorization of cattle manure, wastewater sludge and winery wastes in order to obtain high added value compounds (carboxylates as building blocks, polyphenols or fertilizers) through the biorefinery approach.

Future ambitions:

Ainia is interested in bioproducing current products in a more efficient way and also new valuable products to enhance food safety and sustainable nutrition sources current agriculture performance in the framework of sustainable value chain approach, from biorefinery point of view.

**7. INTEGRATED CO2-BASED PROCESSESS FOR OBTAINING BIOPRODUCTS**

Activities:

Development of CO2-based extraction processes to recover valuable substances for diverse uses (food, cosmetics, pharmaceutics, etc. ) from natural feedstocks, biomass or by-products. Development of CO2-based processes to enhance bioproduct properties: fracionation and purification of compounds, microencapsulation, impregnation of substrates with active compounds, particle design, modification of material properties, inactivation and disinfection of natural matrixes, enzymatic transformation, etc.; CO2 recovery and adequation for further uses; Intensification and scaling-up of CO2-based processes up to industrial purposes: integration of CO2-based processes and other green GRAS technologies within global processing aiming for global sustainable and techno-economically feasible processes.

Future ambitions:

Ainia is interested in promoting CO2 integrated processes in order to use efficiently available CO2 sources to produce current and new bioproducts and thus to avoid the use of other chemical substances or processes that imply more CO2 generation. Through CO2-based processes (sub-critical and super-critical) it is possible to obtain safe and sustainable bioproducts to reinforce food safety and sustainable nutrition. Also, CO2-based processes may be considered as steps to be integrated in biorefinery processes in accordance to BBE.

**8. AQUACULTURE**

Activities:

Obtention of bioproducts to be used in aquaculture feed as nutrients, additives, etc.; bioproduction of biomass as a source of bioaditives to promote fish health and reduce synthetic additivation; protection of active substances in order to reduce costs and reinforce safe aquaculture practices.

Future ambitions:

Ainia is interested in applying bioproduct possibilities to enhance current aquaculture performace, boosting safety and looking for an optimised scenario to produce human feedstocks in a feasible and sustainable manner according to BBE.

**9. SCALE-UP AND DEVELOPMENT OF FACILITIES**

Activities:

Scale-up of process from laboratory up to industrial scale; identification of key process variables in scaling-up; design and building up of specific facilities for non-conventional purposes.

Future ambitions:

Ainia is interested in supporting current knowledge at laboratory and pilot scale to make possible to come up to large scale realities applying current and future technological progress, taking into account key industrial aspects and technical-economic balances to enable real feasible industrial innitiatives.

**C. PRODUCTS, MARKETS and POLICIES.**

**10. BIOGAS/BIOMETHANE.**

Activities:

AGROBIOMET (MICINN, 2010-2013) project is a demonstrative project of a sustainable system of production and use of biomethane in vehicles from agro-waste and alternative biomasses. An industrial depuration installation is used to produce biomethane next to an industrial agro biogas plant. This project is the first that produce biomethane from the biogas produced in a agro-biogas plant fed with cow manure and other agro-wastes in Spain. Technology used in this project to upgrade biogas into biomethane is based on MEA absorption. Ainia has developed an Internet tool to evaluate the sustainability of producing and using Biomethane in cooperation with Ciemat (METANIZA+).

Future ambitions:

ainia is interested in continuing the promotion of biomethane as an alternative and renewable fuel, the production of biomethane from other agro-wastes and lignocellulosic feedstock, and the new and cheaper strategies and technologies to produce biomethane. Also to evaluate new technologies for biogas upgrading. To keep working on the use of biomethane in vehicles (tractors, vans, cars, etc. at rural areas) through demonstration projects. To study the best conditions for biomethane injection in gas grids.

**11. NEW ADVANCED FERTILISERS AND BIOSUBSTANCES FOR AGRICULTURE (PLANT NUTRITION).**

Activities:

Ainia has researched on bio- and physical processes aiming to obtain added value liquid/solid biobased products for agriculture from digestates and different agro-wastes (i.e. efficient composting processes, filtration, centrifugation, etc.). Determination of the most important parameters to validate the agronomic use of digestate (macro and micronutrients concentration, fitotoxicity tests, sanitation level, etc. In DIGESTMART (ECO-INNOVATION project) 2013-2014, ainia is now validating an advanced system to recover nutrients from digestates, especially nitrogen, through thermo-chemical and distillation treatments and thermal solar integration. Ainia is experienced on nutrient balances to sustainably apply N and P rich materials to soils. Pilot plants for researching drop fertilising (fertirrigation) with liquid wastes are available. In the other hand, ainia currently develops bioproduction processes based on fermentative technologies to transform first and second generation feedstocks into valuable substances like bionutrients, biostimulants, bioellicitors, etc; Scaling-up of bioproduction processes to define techno-economically feasible process for industrial purposes; Recovery and recycling of valuable components (nutrients and others).

Future ambitions:

New research on digestate upgrading and alternative uses. Ainia is interested in developing new technologies to recovery valuable components from the biogas digestates and formulation news biofertilisers with the digestates. Ainia is also interested in developing new fermentative technologies to be usable to produce new valuable products to boost current agriculture performance in accordance to BBE.

1. **Specific interest in SPIRE**

Most of the 911 ainia´s associates (private companies) are biobased industries from sectors active in the biobased value chain and applying biobased processes to make a wide range of food products and feed, chemicals, biofuels or bioenergy.

Our mission as a private non-profit research center is essentially to "add value to companies by leading innovation and technological development in a responsible and committed way".

During our 25 years of activity, ainia has been involved in a number of public-private partnerships (PPPs) to achieve successful research and development objectives. One good example is the Spanish PPP Probiogas ([www.probiogas](http://www.probiogas)) which involved during the period 2007-2012 to 28 partners, 13 industries, 14 public/private RTO and IDAE (Spanish Ministry of Industry) with the co-financing support of the Ministry of Science and Technology (MICINN). Ainia was the principal coordinator of this project with an overall budget for the whole period of 9M€.

The current ainia´s research areas and future ambitions (see sections 2 and 3) for the period 2015-2020 are strongly related with the main objectives of SPIRE.

We are convinced to be able to help in the definition of the most efficient SPIRE roadmap taking profit of our know-how and experience in European projects.

We are convinced that SPIRE is a very useful instrument to support the European industrial research and innovation and bring together the resources needed to address the challenges involved in commercializing major society-changing new technologies. We would be honoured to be part of the Consortium about the following topic in SPIRE:

### SPIRE 03-2016: Industrial technologies for the valorisation of European bio-resources into high added value process streams

We are committed to contribute in the challenging process that this PPP is facing next months and beyond.

1. **Relevant experts available in the organisation, mentioning field of expertise**

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| **Name :** | PASCUAL | **First Name:** | ANDRES | **Nationality:** | Spanish |
| **Qualification:** | AGRICULTURE ENGINEER | | | | |
| **Staff category\*:** | HEAD OF DEPARTMENT. Senior expert. | | | | |
| **Short description of work experience** | Head of Environment Dpt. Agriculture Engineer by the by the Universidad Politécnica de Valencia (Spain), speciality in Food Processing. His is 16 years experienced on industrial R&D. Areas of technical specialization are: bioenergy (biogas, biomethane, biohydrogen, microalgae), hygienic design & EHEDG, cleaning and disinfection, ozone, food safety management systems, traceability and food chain analysis, water technologies, carbon and water footprint, resource and eco-efficiency, IPPC/IED and Best Available Techniques (BATs). He is the current coordinator of the Food for Life –Spaish platform particularly of the Working Group “Quality, Production and Sustainability”. Recently, he has becomed member of the Executive Committee of the European Hygienic Engineering and Design Group (EHEDG). Board member of the International Ozone Association (IOA) and associate to the International Water Association. Active member of other technological platforms like the Water Spanish Platform (PTEA) and Bioenergy (BIOPLAT). His experience as a research project coordinator is wide at national/EU/International scale: PSE-PROBIGAS 2007-2011: a large Spanish National Integrated Research Project by 28 research/industrial partners (9MM€) of financing, LIFE Ozonecip (Best Awarded in 2011), 0.8MM€, LIFE+INTEGRAL-B 1.0MM€. As a head of Dpt. Is daily coordinating a multidisciplinary group of 10 senior engineers. | | | | |

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| **Name of person:** | RUIZ | **First Name:** | BEGOÑA | **Nationality:** | Spanish |
| **Qualification:** | Chemical engineer | | | | |
| **Staff category\*:** | TECHNICIAN. Senior expert. | | | | |
| **Short description of work experience** | Researcher in ainia Technology Centre since 2001, on the field of biomethanation of agro-industrial waste through anaerobic co-digestion, including agronomic valorization of the digestate and treatment. Experience in related projects: SAFEDIGEST. Development of a new protocol to reuse to agri-feeding by-products using anaerobic co-digestion processes. PROBIOGAS. Development of sustainable production systems and use of agro-industrial biogas in Spain. Experience in digestate treatment technologies, particularly solid-liquid separation and ammonia stripping. | | | | |

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| **Name of person:** | RODRIGO | **First Name:** | ALFREDO | **Nationality:** | Spanish |
| **Qualification:** | PhD in Agriculture Engineering | | | | |
| **Staff category\*:** | TECHNICIAN. Senior expert. | | | | |
| **Short description of work experience** | 15 years-experienced project manager. Specialist in food industrial environment and BAT evaluation. Technical writer of 6 national guides on BATs (including Seefood products). Development of several R&D national and international projects on cleaner production. Experience in LCA and carbon footprint assessment in food product and installations. | | | | |

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| **Name :** | TORNERO | **First Name:** | ANTONIO | **Nationality:** | Spanish |
| **Qualification:** | Degree in Chemical Sciences specialized on instrumental analysis and industrial technologies of fats and oils, | | | | |
| **Staff category\*:** | HEAD OF DEPARTMENT. Senior expert. | | | | |
| **Short description of work experience** | Head of Process and Engineering Department. He has more than seventeen years of professional experience involving industrial businesses, taking part in development and scale-up of technologies, including the design, building-up and start up of the first multipurpose industrial facility in Spain to provide supercritical extraction services. | | | | |

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| **Name of person:** | CASAS SANZ | **First Name:** | ELVIRA | **Nationality:** | Spanish |
| **Qualification:** | MEng in Chemical Engineering. Master Specialization in Process Engineering | | | | |
| **Staff category\*:** | TECHNICIAN. Senior expert. | | | | |
| **Short description of work experience** | Responsible of the supercritical fluid pilot plant in ainia. Senior researcher and project manager with over eleven years of professional experience in theoretical studies, specialised training, experimental and management activities involving technologies such as CO2 processing, supercritical processes, bioproduct extraction/purification, microalgae processing, micro/nanoencapsulation, intensification and integration of processes, biorefinery, etc. She has also experience in design and buildind up of facilities regarding non-conventional processes, such as CO2-based and supercritical processes: extraction, reaction, adsorption, impregnation, etc. | | | | |

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| **Name of person:** | RIVERA PATIÑO | **First Name:** | DANIEL | **Nationality:** | Spanish |
| **Qualification:** | MEng in Chemical Engineering. Master in Food Engineering and science, | | | | |
| **Staff category\*:** | TECHNICIAN. Senior expert. | | | | |
| **Short description of work experience** | Researcher and Project Manager with over nine years of professional experience from Chemical Laboratory direction, industrial installation management, and research activities in processes involving different kind of microalgae processing, micro/nanoencapsulation -specially spray drying and supercritical fluids-, process integration, etc. | | | | |

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| **Name of person:** | GARCIA SUAREZ | **First Name:** | MIGUEL | **Nationality:** | Spanish |
| **Qualification:** | MEng in Chemical Engineering. | | | | |
| **Staff category\*:** | TECHNICIAN. Senior expert. | | | | |
| **Short description of work experience** | Researcher and Project Manager with over six years of professional experience involving technologies such as CO2 processing, supercritical processes, bioproduct extraction, intensification of processes, etc. | | | | |

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| **Name of person:** | TORREJON CABELLO | **First Name:** | ANA | **Nationality:** | Spanish |
| **Qualification:** | Chemical Engineer | | | | |
| **Staff category\*:** | TECHNICIAN. | | | | |
| **Short description of work experience** | She works as a Project Engineer in ainia since 2010. She has more than 3 years of experience in the field of the industrial Bioproduction on ainia's Bioproduction Pilot Plant, especially in Integrated Systems Engineering Bioproduction (Biotechnology), from the up-stream, bioprocess and dowstream. Afterwards, she was involved in supercritical CO2 extraction at industrial scale ALTEX, a multipurpose extractive plant, dealing with process performance, quality control and design of new processes. | | | | |

1. **Commitment (in terms of willingness to invest the necessary time).**

Ainia is willing to participate in SPIRE through a group of highly qualified staff (see the list of experts available at section 5, only as a reference). A selected representative/s will more often participate in the PPP´s activities: seminars, meetings, videoconferences and required written contributions. If necessary, ainia will be honoured to host meetings at its modern headquarters in Valencia (Spain). Moreover, our electronic weekly and monthly technological bulletins with thousands of industrial recipients will be activated to communicate our activities and PPP´s news.