

## CURRICULUM VITAE ABREVIADO (CVA)

**IMPORTANT** – The Curriculum Vitae **cannot exceed 4 pages**. Instructions to fill this document are available in the website.

### Part A. PERSONAL INFORMATION

First name	Mercedes		
Family name	Fernández Serrano		
Gender (*)		Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail	mferse@ugr.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-9007-6118		

(\*) Mandatory

#### A.1. Current position

Position	Full Professor (Catedrática de Universidad)		
Initial date	2/11/2018		
Institution	University of Granada		
Department/Center	Chemical Engineering	Faculty of Science	
Country	Spain	Teleph. number	
Key words	surfactants, detergents, ozone, cleaning processes, enzymatic technology, essential oils, encapsulation, microplastics		

#### A.2. Previous positions (research activity interruptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
1999-2018	Associate Professor/University of Granada
03/2002-07/2002 (4 months)	Interruption due to child birth
03/2004-09/2004 (5 months)	Interruption due to child birth
02/2013-09/2013 (6 months)	Interruption due to child birth

#### A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Licenciada en Ciencias Químicas	University of Granada/Spain	1990
PhD (Doctora en Ciencias Químicas)	University of Granada/Spain	1995

(Include all the necessary rows)

### Part B. CV SUMMARY (max. 5000 characters, including spaces)

Mercedes Fernández Serrano, a **Full Professor** at the Chemical Engineering Department of the University of Granada (2/11/2018). I obtained my PhD in Chemistry from the University of Granada in 1995, I became a Reader at the Chemical Engineering Department of the University of Granada in 1996, and Associate Professor in 1999.

The research and projects in which I have participated have been developed within the **research group** "Interface engineering and biochemical technology (**RNM 332**)" that I **lead since 2011**. The thematic lines followed have been: **1)** "Oxygen transfer in bioreactors", where I have determined oxygen transfer parameters using chemical and dynamic methods. **2)** "Biodegradation of phenolic compounds", using a *Pseudomonas* sp. **3)** "Enzymatic kinetics", where I carried out the modeling of different enzymatic reactions of industrial interest. **4)** "Encapsulation", using the self-assembly of colloidal particles technique to make colloidosomes. **5)** "Development of detergents with low environmental impact" which includes



the tasks of determining toxicity and biodegradation of the surfactants and their mixtures, and the development and application of specific protocols for the cleaning of hard surfaces to improve performance and to reduce the environmental impact of these processes.

My scientific profile and achievements obtained can be summarized in the following way: participation in 13 Research Projects (Principal Researcher in 2 of them), 1 grant for scientific and technological infrastructure, co-author of 46 papers included in JCR, mainly in Q1 and Q2, 4 of them in D1, with a total of 1019 citations; h-index: 17.; Co-author of 6 chapter of books; 60 communications in Conferences, most of them International. As result of this work, I have **four** "Periodic evaluation of the research activity (**sexenios**)", date of the last one: December 2019.

I have carried out research stays: **1)** School of Chemical and Bioprocess Engineering (**University College Dublin**, Ireland) in July 2014, funded by Univ. of Granada for the *Study of devices and techniques for crystalization*, with Prof. Glennon **2)** **BP Institute**, Chemical Engineering and Biotechnology Department (**University of Cambridge**, UK), since 18 Sep. to 23 Dec. 2015, funded by Univ. of Granada for the study of *Techniques for encapsulation*, with Prof. Routh; **3)** Chemical Engineering and Biotechnology Department (**University of Cambridge**, UK), since 1 Sep. to 31 Dec. 2016, funded by Ministerio de Educación, Cultura y Deporte. Estancias de Prof. Senior en Centros extranjeros. Prog. Salvador Madariaga, for the study of *Fouling and cleaning techniques*, with Prof. Wilson.

The collaboration with Dr. Methneni and Prof. Mansour (**University of Monastir**, Tunisia) has resulted in the publication of 3 articles in Q1 JCR journals and the application of a Horizon TMA MSCA Postdoctoral Fellowships 2021.

The research carried out has been a consistent trajectory in the field of **biotechnology**: bioreactors, biodegradation, enzymatic reactions, focused, in recent years, on the ecotoxicological characterization of surfactants to develop formulations of effective detergents that are less harmful to the environment. My interest in the stability of enzymes for detergent formulations led me to work during my stay at the BP Institute of the University of Cambridge with the group "Colloidal Dispersions", led by Professor A. Routh, specialist in encapsulation. My main interest and objective in the **future** is the development of cleaning maps for the removal of mixed dirties, using different cleaning formulations. These formulations may contain immobilized enzymes, encapsulated enzymes and essential. The growing concern of the scientific community for the massive arrival of nanoparticles and microplastics to wastewater treatment plants, leads me to focus on the interactions between surfactants, NPs, and MPs in wastewaters to have an important knowledge of the fate of these **contaminants of emerging concern** (CEC).

I have **evaluated projects** for SGS ICS Ibérica and for HEALTH CANADA, reviewing "Draft Screening Assessment for Alkyl Imidazolines (surfactants, CAS 95-38-5-27136-73-8, 68442-97-7 and 68966-38-1)". I have participated in **social dissemination** through activities as the European Researchers' Night, Project to Initiate Research and Innovation in Secondary School (PIIIISA), and Summer Scientific Campus.

I have supervised as Director 4 **Doctoral Thesis** (one in progress) and 13 **Master Thesis**.

My contribution to the **transfer of knowledge** is reflected in the participation in 7 research contracts with different industries, acting in two of them as leader research.

I have been **Head of the Chemical Engineering Department** of the University of Granada since March 2012 to October 2020.

## Part C. RELEVANT MERITS (sorted by typology)

### C.1. Publications (see instructions)

**ART1** (Q1) I. Lobato-Guarnido, G. Luzón, F. Ríos, **M. Fernández-Serrano** (2023) Synthesis and characterization of environmentally friendly chitosan–Arabic gum nanoparticles for encapsulation of oregano essential oil in Pickering emulsion, *Nanomaterials*, 13(9), 2651. DOI: 10.3390/nano13192651

**ART2** (Q1) M. Lechuga, A. Ávila-Sierra, I. Lobato-Guarnido, A.I. García-López, F. Ríos, **M. Fernández-Serrano** (2023) Mitigating the skin irritation potential of mixtures of anionic and non-ionic surfactants by incorporating low-toxicity silica nanoparticles. *J. Mol. Liq.* 383, 122021



**ART3** (Q1) F. Ríos, M. Lechuga, I. Lobato-Guarnido, **M. Fernández-Serrano** (2023) Antagonistic Toxic Effects of Surfactants Mixtures to Bacteria *Pseudomonas putida* and Marine Microalgae *Phaeodactylum tricornutum*. *Toxics*, 11, 344

**ART4** (Q1) Environmental impact assessment of nanofluids containing mixtures of surfactants and silica nanoparticles. M. Lechuga, **M. Fernández-Serrano**, F. Ríos, A. Fernández-Arteaga, R. Jiménez-Robles (2022). *Environ. Sci.Poll. Res.* 29, 84125–84136

**ART5** (Q1) N. Methneni, J.A.Morales-González, A. Jaziri, H.B. Mansour, **M. Fernández-Serrano** (2021). Persistent organic and inorganic pollutants in the effluents from the textile dyeing industries: Ecotoxicology appraisal via a battery of biotests. *Environ. Res.*, 196, 110956

**ART6** (Q1) N. Methneni, J.A. González, J. Van Loco, R. Anthonissen, J.V. de Maele, L. Verschaeve, **M. Fernández-Serrano**, H.B. Mansour (2021). Ecotoxicity profile of heavily contaminated surface water of two rivers in Tunisia. *Environ. Toxicol. Pharmacol.*, 82, 103550

**ART7** (Q2) **M. Fernández-Serrano**, A.F. Routh, F. Ríos, F. Caparrós-Salvador, M. Alhaj Salih Ortega (2020) Calcium Alginate as a Novel Sealing Agent for Colloidosomes. *Langmuir* 36, 8398-8406

**ART8** (D1) I. Lobato, A.F. Routh, M.D. Mantle, **M. Fernández-Serrano**, P.C. Marr (2019) Ionic liquid microcapsules: Formation and application of polystyrene microcapsules with ionic liquid cores. *ACS Sustainable Chem. Eng.* 7, 1870-1874

**ART9** (Q1) O. Herrera-Márquez, **M. Fernández-Serrano**, M. Pilamala, M.B. Jácome, G. Luzón (2019) Stability studies of an amylase and a protease for cleaning processes in the food industry. *Food Bioprod. Process.*, 117, 64-73

**ART10** (D1) F. Ríos, A. Fernández-Arteaga, **M. Fernández-Serrano**, E. Jurado, M. Lechuga (2018) Silica micro- and nanoparticles reduce the toxicity of surfactant solutions. *J. Hazard. Mater.*, 353, 436-443

## C.2. Congress

**CONG1.** 9<sup>th</sup> World Congress on Particle Technology. Detergents additives encapsulation using silica nanoparticles with a metal coating. I. Lobato, G. Luzón, F. Ríos, S.I. García-López, **M. Fernández-Serrano**. 18-22/09/2022. Madrid (Spain). **Oral presentation.**

**CONG2.** 3<sup>rd</sup> Mediterranean Congress on Bio-analysis. Profiling ecotoxicology of Tunisian textile wastewater before and after treatment. N. Methneni, JA Morales, **M. Fernández-Serrano**, H.B. Mansour. 13-15/12/2019 Mahdia (Tunisia). Organised by Association Scientifique d'Ecotoxicology. **Poster.**

**CONG3.** 11<sup>th</sup> World Surfactant Congress. Influence of hydrophilic silica nanoparticles on surfactant properties, **M. Fernández-Serrano**, M. Lechuga, E. Jurado, A. Fernández-Arteaga, J.A. Morales, P. Azcarate. 3-5/06/2019 Munich (Germany) Organised by CESIO. **Poster.**

**CONG4.** 3<sup>rd</sup> International Congress of Chemical Engineering. Impacts of mixtures nanoparticles-surfactants in biological processes in EDARs. M. Lechuga, G. Luzón, J.A. Morales, A. Aguirre, P. Azcárate, E. Jurado, **M. Fernández-Serrano**. 19-21/06/2019 Santander (Spain) Organised by ANQUE. **Poster.**

**CONG5.** ICheaP14 & EFF2019. Activity and stability in the presence of a non-ionic surfactant of a protease for hard surface cleaning in food industry O. Herrera, **M. Fernández-Serrano**, M. Pilamala, M.A. Jácome, E. Jurado, G. Luzón. 26-29/05/2019 Bologna (Italy) Organised by AIDIC. **Oral presentation.**

## C.3. Research projects

**PROJ1** PP2022.EI.05 “QSAR Modeling of skin irritation of surfactant-based formulations using in vitro methods.”. Funded by: University of Granada (Spain). Principal researcher: M. Lechuga– University of Granada (Spain). Date: 26/10/2022 – 26/10/2024). Funded budget: 7,500.00 €

**PROJ2** PP2021.PP-08 “Assessment of the environmental impact of washing waters in the presence of nanoparticles and microplastics”. Funded by: University of Granada (Spain). Principal researcher: M. Fernández Serrano – University of Granada (Spain). Date: 29/10/2021 – 28/10/2022). Funded budget: 3,000.00 €. Role within project: **Principal Researcher.**

**PROJ3** “Valorization of vegetable waste for its use as surfactant, antibacterial and antioxidant agents and its application in cleaning, food and cosmetic products”. Funded by: University of



Granada (Spain) Principal researcher: Ana Isabel García López. Date: 27/10/2022 - 26/10/2023. Funded budget: 8000€. Role within project: Researcher

**PROJ4** P20\_00167 - "Recovery of plastic waste from the rejected fraction of urban solid waste treatment plants through pyrolysis". Funded by: Junta de Andalucía (PAIDI 2020). Principal researcher: M. Calero- University of Granada (Spain). Date: 04/01/202 – (Active, until 31-12-2022). Funded budget: 67,200.00 €. Role within project: **Researcher**.

**PROJ5** A-TEP-030-UGR18 - "Immobilization of Enzymes for Inclusion in Surfactant Formulations for Cleaning of Mixed Food Dirt". Funded by: FEDER Andalucía 2014-2020. Principal researcher: E. Jurado Alameda- University of Granada (Spain). Date: 01/01/2020 – (Active, until 31-12-2021). Funded budget: 14,900.00 €. Role within project: **Researcher**.

**PROJ6** - CTQ2015-69658-R - "Formulaciones tensioactivas y protocolos de limpieza CIP para la industria alimentaria, utilizando nanofluidos, enzimas y ozono". Funded by: Ministerio de Economía y Competitividad-2015. Principal researcher: E. Jurado Alameda- University of Granada (Spain). Date: 01/01/2016 – 31/12/2019. Funded budget: 148,830.00 €. Role within project: **Researcher**.

**PROJ7** "Dihydroxyacetone purification from its production growth media". Funded by: University of Granada (Spain). Principal researcher: M. Fernández Serrano – University of Granada (Spain). Date: 01/01/2015 –31/12/2015). Funded budget: 3,000.00 €. Role within project: **Principal Researcher**.

**PROJ8** P09-RNM-5196 "Development of new biotechnological processes from microbial solubilization of alternative sources of phosphates and elaboration of bio-fertilizers based on meat and agro-industrial waste". Funded by: Andalusia Regional Ministry of Innovation, Science and Business (Excellence Projects, Andalusia Regional Government). Principal researcher: N. Bojkov - University of Granada (Spain). Date: 02/2010 - 01/2014. Funded budget: 152.424 €. Role within project: **Researcher**.

**PROJ9** - CTM2010-16770- "Ecological surfactant formulations specific for different soils and substrates ". Funded by: Spanish Science and Innovation Ministry (Fundamental Research Projects National Program of the VI Scientific Research, Development and Technological Innovation National Plan). Principal researcher: E. Jurado Alameda- University of Granada (Spain). Date: 01/01/2011– 01/01/2014. Funded budget: 125.840 €. Role within project: **Researcher**.

#### C.4. Contracts, technological or transfer merits

**CONTRACT1:** "Evaluation study for the replacement of fluorinated components used in the manufacture of vegetable paper by non-fluorinated agents" Company: Lecta-Torras Papel S.A.

**Project leader: M. Fernández Serrano.** Date: 01/07/2023 – 01/11/2023. 7.880,66 €.

**CONTRACT2:** "Asesoramiento para la mejora del proceso de limpieza en mezcladoras de la fabricación de SILESTONE" Company: Cosentino Reserch and Development S.L. Project leader: M. Fernández Serrano. Date: 11/12/2021 – 11/03/2022. 4.403,06 €.

**CONTRACT3:** "Biodegradability tests" Company: SENSIENT COLORS UK LTD. Project leader: M. Lechuga Villena. Date: 01/09/2020 – 31/11/2020. 11.943,45 €.

**CONTRACT4:** "Biodegradability tests" Company: SENSIENT COLORS UK LTD. Project leader: M. Lechuga Villena. Date: 01/09/2020 – 31/11/2020. 17.116,41 €.

**CONTRACT5.** "Investigation of physico-chemical properties and of the rheological behavior in mixtures with resin, of charges minerals used in formulations for the manufacture of stone agglomerate (type Silestone®)". Company: COSENTINO RESEARCH AND DEVELOPMENT, S.L.U. Project leader: G. Luzón González, M.A. Martín Lara. Date: 5/11/2019-11/11/2020. 2.250 €

**CONTRACT6:** REF: AEI-010600-2018-108 "H<sub>2</sub>-smart estudio de viabilidad para la integración de la tecnología de hidrógeno como solución para la intermitencia y el almacenamiento de energía de origen renovable" Company: ASOCIACIÓN EMPRESARIAL MULTISECTORIAL INNOVADORA PARA LAS CIUDADES INTELIGENTES. CLUSTER ANDALUCÍA SMART CITY + LETTER Ingenieros. Project leader: G. Luzón González. Date: 7/09/2018 – 31/12/2018. 10.064 €.

**CONTRACT7:** "Study of physical-chemical characteristics of byproducts of biomass transformation processes for their valorization" Company: DMC Research Center S.L. Project leader: M. Fernández Serrano. Date: 14/04/2012 – 13/04/2015. 17.700,00 €.



**CURRICULUM VITAE ABREVIADO (CVA)**

**IMPORTANT** – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

**Part A. PERSONAL INFORMATION**

First name	MANUELA		
Family name	LECHUGA VILLENA		
Gender (*)		Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail	nlvillen@ugr.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-9575-3245		

(\*) Mandatory

**A.1. Current position**

Position	Associate Professor		
Initial date	04/07/2018		
Institution	University of Granada		
Department/Center	Chemical Engineering Department	Faculty of Sciences	
Country	Spain	Teleph. number	+34 958241000. Ext. 20164
Key words	Environmental impact, surfactants, detergency, toxicity, biodegradation, nanoparticles, skin irritation, essential oils, microplastics		

**A.2. Previous positions (research activity interruptions, indicate total months)**

Period	Position/Institution/Country/Interruption cause
7/2009-2/2010 (6 months)	Interruption due to child birth
1/2013-9/2013 (8 months)	Interruption due to child birth

**A.3. Education**

PhD, Licensed, Graduate	University/Country	Year
Chemical engineer (Ingeniería Química)	University of Granada	1999
PhD (Doctora en Ingeniería Química)	University of Granada	2006

**Part B. CV SUMMARY** (max. 5000 characters, including spaces)

Manuela Lechuga Villena, an **Associate Professor** at the Chemical Engineering Department of the University of Granada (4/7/2018). I obtained my PhD in Chemical Engineering from the University of Granada in 2006, I became a researcher hired for an investigation project the University of Granada in 2000.

The research and projects in which I have participated have been developed within the **research group** "Surfactants enzymes and emulsions (**TEP-212**, <https://tep212.ugr.es/>) since 2000. The thematic lines followed have been: **1)** "Development of detergents with low environmental impact" which includes the tasks of determining toxicity and biodegradation of the surfactants and their mixtures, and the development and application of specific protocols for the cleaning of hard surfaces to improve performance and to reduce the environmental impact of these processes. **2)** "Environmental impact of washing waters in the presence of



nanoparticles and microplastics” and recently **3)** “Skin irritation of base formulations surfactant by in vitro methods”.

I have 28 indexed publications, ten of which are in the first quartile and belonging to the Top 10 of the articles published in the same subject since its publication. I also own 1 book and 2 book chapter. In addition to 30 contributions to congresses, 9 of which were oral. I have participated in several scientific dissemination activities and projects: XI Week of Science 2011, Summer Scientific Campus 2011 and 2012, Science and Society Project 2011 and Project of Initiation to Research in Innovation in Secondary 2012. I have participated as a contracted researcher and collaborator in 11 research projects financed by public bodies and companies (European Commission, Ministry of Education, Junta de Andalucía, University of Granada and Tino Stone Group). The participation as a researcher with the company Tino Stone Group has allowed the development and commercialization of cleaning formulations for hard surfaces of great commercial interest. Regarding the transfer of knowledge to the productive sector, I have carried out scientific-technical consultancies and collaborated in i + D + I through 3 contracts and projects with companies: Sensient colors, Moviboxes Spain S.L., and DMC Research Center S.L. I have participated as a technical expert in the evaluation of more than 60 research projects within the line of detergents and surfactants for certification companies.

Finally I include the general indicators of the quality of my scientific production:

Total Cites: 634 (SCOPUS), 675 (WOS)

Average cites per year (last 5 years): 28.71 (SCOPUS), 26.79 (WOS)

First quartile publications (Q1): 12

h-index: 12

### Part C. RELEVANT MERITS (sorted by typology)

#### C.1. Publications (see instructions)

**ART1** (Q1) M. Lechuga, A. Ávila-Sierra, I. Lobato-Guarnido, A.I. García-López, F. Ríos, M. Fernández-Serrano (2023) Mitigating the skin irritation potential of mixtures of anionic and non-ionic surfactants by incorporating low-toxicity silica nanoparticles. *J. Mol. Liq.* 383, 122021

**ART2** (Q1) F. Ríos, M. Lechuga, I. Lobato-Guarnido, M. Fernández-Serrano (2023) Antagonistic Toxic Effects of Surfactants Mixtures to Bacteria *Pseudomonas putida* and Marine Microalgae *Phaeodactylum tricornutum*. *Toxics*, 11, 344

**ART3** (Q1) Environmental impact assessment of nanofluids containing mixtures of surfactants and silica nanoparticles. M. Lechuga, M. Fernandez-Serrano, F. Ríos, A. Fernández-Arteaga, R. Jiménez-Robles (2022). *Environ. Sci.Poll. Res.* 29, 84125–84136

**ART4** (Q1) A. Ávila-Sierra, J.M. Vicaria, M. Lechuga, J.F. Martínez-Gallegos, V. Olivares-Arias, A.C. Medina-Rodríguez, R. Jiménez-Robles, E. Jurado-Alameda, 2021, Insights into the optimisation of the Clean-In-Place technique: Cleaning, disinfection, and reduced environmental impact using ozone-based formulations. *FOOD BIOPROD. PROCESS.* 129 124-133.

**ART5** (D1) F. Ríos, A. Fernández-Arteaga, M. Fernández-Serrano, E. Jurado, M. Lechuga (2018) Silica micro- and nanoparticles reduce the toxicity of surfactant solutions. *J. Hazard. Mater.* 353, 436-443

**ART6** (Q1) F. Rios, A. Fernandez-Arteaga, M. Lechuga, M. Fernandez-Serrano (2017) Ecotoxicological characterization of polyoxyethylene glycerol ester non-ionic surfactants and their mixtures with anionic and non-ionic surfactants, *ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH*, 24, 10121-10130.



**ART7 (Q1)** F. Ríos, M. Lechuga, M. Fernández-Serrano, A. Fernández-Arteaga (2017) Aerobic biodegradation of amphoteric amine-oxide-based surfactants: Effect of molecular structure, initial surfactant concentration and pH. CHEMOSPHERE 171, pp. 324-331.

**ART8 (Q2)** F. Ríos, M. Lechuga, A. Fernández-Arteaga, E. Jurado, M. Fernández-Serrano (2017) Anaerobic digestion of amine-oxide-based surfactants: biodegradation kinetics and inhibitory effects. BIODEGRADATION, DOI 10.1007/s10532-017-9797-6.

**ART9 (Q1)** F. Ríos, A. Fernandez-Arteaga, M. Lechuga, E. Jurado, M. Fernandez-Serrano (2016) Kinetic study of the anaerobic biodegradation of alkyl polyglucosides and the influence of their structural parameters, ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, 23, 8286-8293

**C.2. Congress**, indicating the modality of their participation (invited conference, oral presentation, poster)

**CONG1.** 11<sup>th</sup> World Surfactant Congress. Influence of hydrophilic silica nanoparticles on surfactant properties, M. Fernández-Serrano, **M. Lechuga**, E. Jurado, A. Fernández-Arteaga, J.A. Morales, P. Azcarate. 3-5/06/2019 Munich (Germany) Organised by CESIO. **Poster.**

**CONG2.** 3<sup>rd</sup> International Congress of Chemical Engineering. Impacts of mixtures nanoparticles-surfactants in biological processes in EDARs. **M. Lechuga**, G. Luzón, J.A. Morales, A. Aguirre, P. Azcárate, E. Jurado, M. Fernández-Serrano. 19-21/06/2019 Santander (Spain) Organised by ANQUE. **Poster.**

**C.3. Research projects**, indicating your personal contribution. In the case of young researchers, indicate lines of research for which they have been responsible.

**PROJ1** PP2022.EI.05 “QSAR modeling of skin irritation of base formulations surfactant by in vitro methods”. Funded by: University of Granada (Spain) **Principal researcher: M. Lechuga.** Date: 26/10/2022 - 26/10/2024. Funded budget: 7,500.00 €

**PROJ2** PPJIA2022-27 “Environmental assessment of microfibers in combination with surfactants”. Funded by: University of Granada (Spain). Principal researcher: F. Ríos– University of Granada (Spain). Date: 01/01/2023 – 31/12/2023). Funded budget: 1,000.00 €

**PROJ3** PP2021.PP-08 “Assessment of the environmental impact of washing waters in the presence of nanoparticles and microplastics”. Funded by: University of Granada (Spain). Principal researcher: M. Fernández Serrano – University of Granada (Spain). Date: 29/10/2021 – 28/10/2022). Funded budget: 3,000.00 €

**PROJ4** “Valorization of vegetable waste for its use as surfactant, antibacterial and antioxidant agents and its application in cleaning, food and cosmetic products”. Funded by: University of Granada (Spain) Principal researcher: A.I. García López. Date: 27/10/2022 - 26/10/2024. Funded budget: 8,000.00 €

**PROJ5** P20\_00167 - “Recovery of plastic waste from the rejected fraction of urban solid waste treatment plants through pyrolysis”. Funded by: Junta de Andalucía (PAIDI 2020). Principal researcher: M. Calero- University of Granada (Spain). Date: 04/01/202 –31-12-2022. Funded budget: 67,200.00 €

**PROJ6** A-TEP-030-UGR18 - “Immobilization of Enzymes for Inclusion in Surfactant Formulations for Cleaning of Mixed Food Dirt”. Funded by: FEDER Andalucía 2014-2020. Principal researcher: E. Jurado Alameda- University of Granada (Spain). Date: 01/01/2020 – 31-12-2021. Funded budget: 14,900.00 €

**PROJ7** CTQ2015-69658-R - “Surfactant formulations and CIP cleaning protocols for the food industry, using nanofluids, enzymes and ozone”. Funded by: Spanish Ministry of Economy and Competitiveness-2015. Principal researcher: E. Jurado Alameda- University of Granada (Spain). Date: 01/01/2016 – 31/12/2019. Funded budget: 148,830.00 €

**PROJ8** “Dihydroxyacetone purification from its production growth media”. Funded by: University of Granada (Spain). Principal researcher: M. Fernández Serrano – University of Granada (Spain). Date: 01/01/2015 –31/12/2015). Funded budget: 3,000.00 €



**PROJ9** P09-RNM-5196 “Development of new biotechnological processes from microbial solubilization of alternative sources of phosphates and elaboration of bio-fertilizers based on meat and agro-industrial waste”. Funded by: Andalusia Regional Ministry of Innovation, Science and Business (Excellence Projects, Andalusia Regional Government). Principal researcher: N. Bojkov - University of Granada (Spain). Date: 02/2010 - 01/2014. Funded budget: 152,424.00 €

**PROJ10** - CTM2010-16770- “Ecological surfactant formulations specific for different soils and substrates“. Funded by: Spanish Ministry of Science and Innovation (Fundamental Research Projects National Program of the VI Scientific Research, Development and Technological Innovation National Plan). Principal researcher: E. Jurado Alameda- University of Granada (Spain). Date: 01/01/2011– 01/01/2014. Funded budget: 125,840.00 €

**C.4. Contracts, technological or transfer merits**, Include patents and other industrial or intellectual property activities (contracts, licenses, agreements, etc.) in which you have collaborated. Indicate: a) the order of signature of authors; b) reference; c) title; d) priority countries; e) date; f) Entity and companies that exploit the patent or similar information, if any

**CONTRACT1:** “Biodegradability tests” Company: SENSIENT COLORS UK LTD. Project leader: **M. Lechuga Villena**. Date: 01/09/2020 – 31/11/2020. 11.943,45 €.

**CONTRACT2:** “Biodegradability tests” Company: SENSIENT COLORS UK LTD. Project leader: **M. Lechuga Villena**. Date: 01/09/2020 – 31/11/2020. 17.116,41 €.

**CONTRACT3:** “Study of physical-chemical characteristics of byproducts of biomass transformation processes for their valorization” Company: DMC Research Center S.L. Project leader: M. Fernández Serrano. Date: 14/04/2012 – 13/04/2015. 17.700,00 €.

**CONTRACT4:** “Development of Tino products in the stages of laying on site and cleaning and maintenance for cleaning natural stone” Company: TINO STONE GROUP S.A. Project leader: E. Jurado Alameda. Date: 01/05/2011 – 30/05/2011.

**CONTRACT5:** “Evaluation study for the replacement of fluorinated components used in the manufacture of vegetable paper by non-fluorinated agents”. Company: Lecta-Torras Papel S.A. Project leader: M. Fernández Serrano. Date: 01/07/2023-01/11/2023. Budget: 7.880,66 €. Role within contract: Researcher

Firma (1): **MARÍA CARMEN RODRÍGUEZ ROMERO**  
En calidad de: **Solicitante**





## Part A. PERSONAL INFORMATION

First name	Germán		
Family name	Luzón González		
e-mail	german@ugr.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-5529-4304		

(\*) *Mandatory*

### A.1. Current position

Position	Catedrático de Universidad (Professor)		
Initial date	3/11/2018		
Institution	University of Grenade		
Department/Center	Chemical Engineering		
Country	Spain	Teleph. number	958248844
Key words			

### A.2. Previous positions (research activity interruptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
1998-2018	Profesor Titular de Universidad / UGR / España / Promoción a Catedrático
1997-1998	Profesor Titular Interino de Universidad / UGR / España / Promoción a PTU
1994-1997	Profesor Asociado / UGR / España / Promoción a PTIU
1990-1993	Becario FPU / UGR / España

### A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Licensed Ciencias Químicas	University of Grenade/Spain	1989
PhD Ciencias Químicas	University of Grenade/Spain	1993

(Include all the necessary rows)

## Part B. CV SUMMARY (max. 5000 characters, including spaces)

I obtained my PhD in Chemistry from the University of Grenade in 1993 and continued as an Associate Lecturer until 1998, when I joined as Associate Professor and Full Professor since 2018. I am a co-author of 37 articles included in JCR, 12 of them in Q1, with a total of 742 citations in Scopus, and an average of 52 citations/year (2018-2022) H Index: 14. The works indexed in Google Scholar are 53, with 1103 citations, 73 per year (2018-2022), H index: 16. The research and projects in which I have participated have been developed within the research group "Surfactants, Enzymes and Emulsions (TEP-212)", of which I have been responsible since the year 2020. I have worked on the study of the enzymatic kinetics of isomerases, hydrolases and lipases, their application with different reactor configurations, homogeneous, fixed bed, and membrane, both in a single phase and in biphasic in the case of lipases. The experience with enzymes was applied to the study of systems with surface agents for their application in detergents, focusing on CIP (cleaning-in-place) cleaning processes within the food industry. The main objective of this line of research has been the development of specific formulations and protocols for cleaning food residues adhered to hard surfaces optimizing these protocols and analyzing the contaminant load of washing waters to minimize the environmental impact of these washing processes. For the improvement of the process and the decrease of the contaminant load, we have studied the inclusion of ozone and the study of its interaction with enzymes and surfactants in cleaning and its effect on the contaminant load and toxicity of the generated wastewater. My contribution has focused mainly on the interpretation of the results obtained, developing models, and analyzing data, as well as designing and improving facilities and processes in the laboratory, methods of analysis and measurement of physicochemical properties of substances of interest in different projects. In addition, I actively participate promoting the participation of group members in



applying for research projects and contracts. The main interest and future goal is to optimize these detergent processes, extending their study to clean mixed dirt and eliminate allergenic compounds. All this, with the objectives of increasing food safety by improving cleaning and disinfection levels, reducing environmental impact by reducing energy consumption, minimizing chemical product consumption, and replacing them with more environmentally friendly ones and minimizing economic cost these operations. On the other hand, I have collaborated with companies and other research groups on contracts and projects related to clean energy, hydrogen utilization as an energy vector, waste utilization such as coffee grounds through hydrolysis to obtain compounds of interest in nutrition and soil regeneration processes and pyrolysis waste plastics thanks to experience in characterizing physicochemical properties.

## Part C. RELEVANT MERITS (sorted by typology)

### C.1. Publications

- 2/4 authors. Lobato-Guarnido, I., **Luzón, G.**, Ríos, F., Fernández-Serrano, M. Synthesis and characterization of environmentally friendly chitosan–Arabic gum nanoparticles for encapsulation of oregano essential oil in Pickering emulsion (2023). *Nanomaterials*. 13(9), 2651. DOI: 10.3390/nano13192651
- 4/5 authors, 3 citations. Rincón-Romero, J.F., Ríos, F., Reyes-Requena, A., **Luzón-González, G.**, García-López, A.I. Surface and thermodynamics properties of commercial fatty-alcohol ethoxylate surfactants (2023). *Journal of Molecular Liquids*. 376. 121396. DOI: 10.1016/j.molliq.2023.121396
- 4/5 authors, 20 citations. Quesada, L., de Hoces, M.C., Martín-Lara, M.A., **Luzón, G.**, Blázquez, G. Performance of different catalysts for the in situ cracking of the oil-waxes obtained by the pyrolysis of polyethylene filmwaste (2020) *Sustainability (Switzerland)*, 12 (13), art. no. 5482. DOI: 10.3390/su12135482
- 5/5 authors, 16 citations. Herrera-Márquez, O., Fernández-Serrano, M., Pilamala, M., Jácome, M.B., **Luzón, G.** Stability studies of an amylase and a protease for cleaning processes in the food industry (2019) *Food and Bioproducts Processing*, 117, pp. 64-73. DOI: 10.1016/j.fbp.2019.06.015
- 4/8 authors, 45 citations. Pérez-Burillo, S., Pastoriza, S., Fernández-Arteaga, A., **Luzón, G.**, Jiménez-Hernández, N., D'Auria, G., Francino, M.P., Rufián-Henares, J.A. Spent Coffee Grounds Extract, Rich in Manno oligosaccharides, Promotes a Healthier Gut Microbial Community in a Dose-Dependent Manner (2019) *Journal of Agricultural and Food Chemistry*, 67 (9), pp. 2500-2509. DOI: 10.1021/acs.jafc.8b06604
- 6/6 authors, 1 citation. Herrera-Márquez, O., Fernández-Serrano, M., Pilamala, M., Jácome, M.B., Jurado-Alameda, E., **Luzón, G.** Activity and stability in the presence of a non-ionic surfactant of a protease for hard surface cleaning in food industry (2019) *Chemical Engineering Transactions*, 75, pp. 187-192. DOI: 10.3303/CET1975032
- 3/3 authors, 14 citations. Martín-Lara, M.A., Iáñez-Rodríguez, I., **Luzón, G.** Improving the internship experience in the Master of Chemical Engineering at the University of Granada (2019) *Education for Chemical Engineers*, 26, pp. 97-106. DOI: 10.1016/j.ece.2018.07.003

### C.2. Congress, indicating the modality of their participation (invited conference, oral presentation, poster)

- Title:** Detergents additives encapsulation using silica nanoparticles with a metal coating.  
**Congress:** WCPT9. 9th World Congress on Particle Technology. Exploring beyond limits. Madrid (Spain), 2022. **Poster** en Congress. **Authors:** Lobato-Guarnido, Ismael; **Luzón-González, G.**; Ríos Ruiz, F.; García López, A.I.; Fernández Serrano, M.
- Title:** Enzymes encapsulation using silica nanoparticles for their utilization in detergents  
**Congress:** 3rd ANQUE-ICCE International Congress of Chemical Engineering, Santander (España), 2019. **Poster** en Congress. **Authors:** Lobato-Guarnido, I.; **Luzón-González, G.**; García-Lopez, A.I.; Fernandez-Serrano, M.
- Title:** Impacts of mixtures nanoparticles-surfactants in biological processes EDARs  
**Congress:** 3rd ANQUE-ICCE International Congress of Chemical Engineering, Santander (España), 2019. **Poster** en Congress. **Authors:** Lechuga-Villena, M.M.a; **Luzón-González, G.**; Morales, J.A.; Aguirre, A.; Azcárate, P.; Fernandez-Serrano, M.



4. **Title:** Activity and Stability in the Presence of a Non-Ionic Surfactant of a Protease for Hard Surface Cleaning in Food Industry. **Congress:** Engineering Future Food 2019, Bolonia (Italia). **Poster. Authors:** Herrera-Márquez, Otilia; Fernandez-Serrano, Mercedes; Pilamala, M.; Jacome, M.B.; Jurado-Alameda, E.; **Luzón-González, G.**
5. **Title:** Elimination process optimization dirt milk using the device BSF (Bath-Substrate-Flow). **Congress:** 4th International Food Safety, Quality and Policy Conference, DUBAI, E.A.U., 2016. **Poster. Authors:** **Luzón-González, Germán;** Burgos Cara, Alejandro; Jurado-Alameda, Encarnación

**C.3. Research projects**, indicating your personal contribution. In the case of young researchers, indicate lines of research for which they have been responsible.

1. **Project:** Valorization of plant waste for its use as surfactant, antibacterial and antioxidant agents and its use in cleaning, food and cosmetic products. **Project leader:** Ana Isabel García López. Date: 01-10-2023 - 31/12/2024. Reference: PP2022. **Funding entity:** University of Granada. **Funded budget:** €8000
2. **Project:** Evaluation of the environmental impact of washing water in the presence of nanoparticles and microplastics. **Project leader:** Mercedes Fernández Serrano. Date: 29-10-2021 - 28/10/2022 Reference: PP2021.PP-08. **Funding entity:** University of Granada. **Funded budget:** €3000
3. **Project:** Enzyme immobilization for inclusion in surfactant formulations for cleaning mixed food soils (A-TEP-030-UGR18). **Funding program:** Junta de Andalucía Projects Modality A. Frontier Knowledge Generation Projects. **Project leader:** Jurado-Alameda, Encarnación; Vicaria-Rivillas, Jose María. 1/1/2020 - 31/12/2021. **Funded budget:** €14900
4. **Project:** H2-smart - Feasibility study for the integration of hydrogen technology as a solution for intermittency and energy storage of renewable origin. Code: AEI-010600-2018-108. Project scope: National. **Funding entity:** Ministry of Industry, Commerce and Tourism. **Project leader:** Luzón-González, Germán. 7/09/2018 - 31/03/2019. **Funded budget:** €10064
5. **Project:** Surfactant formulations and CIP cleaning protocols for the food industry, using nanofluids, enzymes and ozone. Code: CTQ2015-69658-R (MINECO/FEDER). **Funding program:** State Program for Research, Development and Innovation Oriented to Society's Challenges. **Project leader:** Jurado-Alameda, Encarnación 03/02/2017 - 31/12/2019. **Funded budget:** €148830
6. **Project:** Development of specific formulations and cleaning protocols in the food industry. Code: PP2015-10. **Funding program:** Precompetitive projects own plan. Call 2015, UNIVERSITY OF GRANADA. **Project leader:** Jurado-Alameda, Encarnación. 01/01/2016 - 31/12/2016. **Funded budget:** €2575
7. **Project:** Purification of dihydroxyacetone from the culture medium in which it has been produced. Code: PP2014-05. **Funding program:** Precompetitive research projects of the UGR's own plan 2014. **Project leader:** Fernandez-Serrano, Mercedes. 01/01/2015 - 31/12/2015. **Funded budget:** €3000
8. **Project:** High performance processes for circuit hygiene in dairy industries. Code: IDI-20120160. **Funding program:** CDTI-Center for Technological Development in Industry. 30/03/2012 - 30/03/2014. **Funded budget:** €454393
9. **Project:** Ecological surfactant formulations specific for different soils and substrates. Code: CTM2010-16770. **Funding program:** Other programs of the national R&D plan, Ministry of Science and Technology. **Project leader:** Jurado-Alameda, Encarnación. 01/01/2011 - 30/06/2014. **Funded budget:** €125840

**C.4. Contracts, technological or transfer merits**, Include patents and other industrial or intellectual property activities (contracts, licenses, agreements, etc.) in which you have collaborated. Indicate: a) the order of signature of authors; b) reference; c) title; d) priority countries; e) date; f) Entity and companies that exploit the patent or similar information, if any



- Evaluation Study on the Replacement of Fluorinated Components Used in the Manufacture of Greaseproof Paper with Non-Fluorinated Agents. Torrassapel SA-UGR. IP: Fernández-Serrano, Mercedes. (1/07/2023-1/11/2023). 7.880 €
- Advising on the Extraction of Chitosan from American Red Crab Waste. Kitosano S.L-UGR. IP: Fernández-Arteaga, Alejandro; Luzón-González, Germán. (1/07/2021-31/12/2022). 22722 €
- Investigation of physico-chemical properties and of the rheological behavior in mixtures with resin, of charges minerals used in formulations for the manufacture of stone agglomerate (type Silestone®). COSENTINO RESEARCH AND DEVELOPMENT, S.L.U. + Fundación General Universidad de Granada. IP: G. Luzón González, M.A. Martín Lara. (5/11/2019-11/11/2020), 2250 €
- Formación sobre Procesos Biotecnológicos Industriales. Sensient – UGR (CNT4141). IP: Luzón-González, Germán. (1/03/2019 - 31/05/2021), 2777.78 €
- Circular agro-innovation: integral waste valuation for a sustainable olive sector. COUNCIL OF AGRICULTURE, FISHERIES AND RURAL DEVELOPMENT. IP: J. A. Camacho Ballesta (01/02/18 31/12/19). 176.688 EUR
- H2-SMART - Estudio de viabilidad para la integración de la tecnología de hidrógeno como solución para la intermitencia y el almacenamiento de energía de origen renovable. Asociación empresarial multisectorial innovadora para las ciudades inteligentes. CLUSTER ANDALUCÍA SMART CITY-UGR. IP. G. Luzón-González. (1/9/2018-31/3/2019). 20128 €.
- Study of the physico-chemical characteristics of by-products obtained in biomass transformation processes for its valorisation. DOMCA S.L + Universidad de Granada. IP: M. Fernandez-Serrano. (01/06/2012 31/12/13). 15.000 €
- High performance hygiene processes in CIP systems through the development of (nano) - materials and new chemical technologies (CIPNANOTEC). Beltegeux + Universidad de Granada. F. Marti Colomer. (01/06/2012 31/12/13). 59.000 €



## Parte A. DATOS PERSONALES

Nombre *	Alberto J		
Apellidos *	Moya López		
URL Web		Teléfono *	(+34) 953212780
Dirección Email	ajmoya@ujaen.es		
Identificador científico	Open Researcher and Contributor ID (ORCID) *	0000-0002-1169-4728	
	Researcher ID	I-5463-2018	
	Scopus Author ID	7103153140	

\* Obligatorio

### A.1. Situación profesional actual

Puesto	Profesor Titular de Universidad		
Fecha inicio	2002		
Organismo / Institución	Universidad de Jaén		
Departamento / Centro	Ingeniería Química, Ambiental y de los Materiales / Facultad de Ciencias Experimentales		
País	España	Teléfono	(34) 953212780
Palabras clave	Química industrial; Residuo agrícola		

### A.2. Situación profesional anterior

Periodo	Puesto / Institución / País
2019 - 2019	Coordinador del título de experto en cata de aceites de oliva vírgenes (17ª edición) / Universidad de Jaén
2017 -	Coordinador del Máster Universitario en Profesorado de Educación Secundaria Obligatoria y Bachillerato, Formación Profesional y Enseñanza de Idiomas / Universidad de Jaén
2023 -	Director de Secretariado de Equipamiento y Gestión de Espacios de la Universidad de Jaén

### A.3. Formación académica

Grado/Master/Tesis	Universidad / País	Año
Doctor en Ciencias Químicas	UNIVERSIDAD DE JAÉN / España	1997
Licenciatura con grado en Ciencias Químicas	UNIVERSIDAD DE GRANADA / España	1992
Licenciatura en Ciencias Químicas (Especialidad Química Industrial)	Universidad de Granada / España	1989

### A.4. Indicadores generales de calidad de la producción científica

- Nº Tesis doctorales dirigidas (últimos 10 años): 3
- Nº sexenios investigación (MINECO): 3 / Fecha del último concedido: 2014-2019
- Número total de artículos JCR: 20. Número de artículos JCR en primer cuartil (Q1): 10
- Número de citas totales (WOS): 357
- Promedio de citas por año en los últimos 5 años (WOS): 13,1
- Índice h (WOS): 14



## Parte C. MÉRITOS MÁS RELEVANTES

### C.1. Publicaciones

AC: Autor de correspondencia; (n° x / n° y): posición firma solicitante / total autores. Si aplica, indique el número de citaciones

- 1 **Artículo científico.** Soledad Mateo Quero; Gassan Hodaifa; Sebastián Sánchez Villasclaras. (4/4). 2021. Bioconversion study for xylitol and ethanol production by *Debaryomyces hansenii*: aeration, medium and substrate composition influence PREPARATIVE BIOCHEMISTRY & BIOTECHNOLOGY. Taylor & Francis Group, LLC. <https://doi.org/10826068.2021.1983829>
- 2 **Artículo científico.** Soledad Mateo Quero; Silvia Peinado Serrano; Francisca Morillas Gutierrez; M. Dolores La Rubia García. (5/5). 2021. Nanocellulose from AgriculturalWastes: Products and Applications—A Review Processes. MDPI. 9. <https://doi.org/10.3390/pr9091594>
- 3 **Artículo científico.** Soledad Mateo Quero; (AC); Sebastián Sánchez Villasclaras; Manuel Cuevas Aranda. (2/5). 2021. Valorization of olive endocarp from olive oil and table olive processing as a low-cost bioadsorbent for the removal of furfural from aqueous solu Journal of Water Process Engineering. Elsevier. 44. <https://doi.org/10.1016/j.jwpe.2021.102442>
- 4 **Artículo científico.** Bruno Fonseca; Soledad Mateo; Ines C. Roberto; Sebastián Sánchez; Alberto J. Moya. (/5). 2020. Bioconversion in batch bioreactor of olive-tree pruning biomass optimizing treatments for ethanol production Biochemical Engineering Journal. Elsevier. 164. ISSN 1369-703X. <https://doi.org/10.1016/j.bej.2020.107793>
- 5 **Artículo científico.** Silvia Peinado Serrano; Soledad Mateo Quero; Sebastián Sánchez Villasclaras; Alberto J Moya López. (/4). 2019. Effectiveness of sodium borohydride treatment on acid hydrolyzates from olive-tree pruning biomass for bioethanol production BioEnergy Research. Springer. 12, pp.302-311. ISSN 1939-1234.
- 6 **Artículo científico.** Pablo González Torres; Juan G Puentes Campos; Alberto J. Moya López; M. Dolores La Rubia García. (3/4). 2023. Comparative Study of the Presence of Heavy Metals in Edible Vegetable Oils Applied Sciences. <https://doi.org/10.3390/app13053020>
- 7 **Artículo científico.** Soledad Mateo; Gassan Hodaifa; Sebastián Sánchez; (AC). (4/4). 2022. Bioconversion study for xylitol and ethanol production by *Debaryomyces hansenii*: aeration, medium and substrate composition influence Preparative Biochemistry and Biotechnology. Taylor & Francis. 52-6, pp.627-639. <https://doi.org/10.1080/10826068.2021.1983829>
- 8 **Artículo científico.** Sofia Jurado Contreras; Francisco Navas Martos; José A. Rodríguez Liébana; Alberto J. Moya López; M. Dolores La Rubia García. (4/5). 2022. Manufacture and Characterization of Recycled Polypropylene and Olive Pits Biocomposites Polymers. 14-19, pp.4206.
- 9 **Artículo científico.** Alfredo Sánchez Bautista; Ester Palmero; Alberto J. Moya López; Diego Gómez Díaz; M. Dolores La Rubia García. (3/5). 2021. Characterization of Alkanolamine Blends for Carbon Dioxide Absorption. Corrosion and Regeneration Studies Sustainability. MDPI. 13. <https://doi.org/10.3390/su13074011>
- 10 **Artículo científico.** Soledad Mateo Quero; Pilar Mateo; Marco Barbanera; Cinzia Buratti; Alberto J. Moya López. (/5). 2020. Acid hydrolysis of olive tree leaves: Preliminary study towards biochemical conversion Processes. MDPI. 8-8, pp.886-899. ISSN 22279717. <https://doi.org/10.3390/pr8080886>
- 11 **Artículo científico.** Fonseca, Bruno; Mateo-Quero, M<sup>a</sup> Soledad; Moya-López, Alberto J. (AC); Roberto, Ines. (3/4). 2018. Biotreatment optimization of rice straw hydrolyzates for ethanolic fermentation with *Scheffersomyces stipitis* Biomass & Bioenergy. 112, pp.19-28. ISSN 0961-9534. <https://doi.org/10.1016/j.biombioe.2018.02.003>



### C.3. Proyectos y Contratos

- 1 **Proyecto.** LIFE18 ENV/ES/000309, NEW GENERATION OF BIOCOMPOSITES BASED ON OLIVE FIBERS FOR INDUSTRIAL APPLICATIONS. Unión Europea. Programa LIFE 2014-2020. María Dolores La Rubia García. (Universidad de Jaén). 01/07/2019-30/10/2022. 143.480,7 €. Miembro de equipo.
- 2 **Proyecto.** AGR-7092, Aplicación de Tecnologías avanzadas de oxidación en el tratamiento de aguas de lavado de aceite y aceitunas. Consejería de Economía, Innovación, Ciencia y Empleo. GASSAN HODAIFA MERI. 01/01/2014-01/01/2017. 189.894 €. Miembro de equipo.
- 3 **Proyecto.** 2015/00186, Estudio de procesos de deslignificación del residuo de poda de olivo. Aplicación a su aprovechamiento bioquímico.. INSTITUTO DE ESTUDIOS GIENENSES. ALBERTO J. MOYA LÓPEZ. (Universidad de Jaén). 10/11/2015-10/11/2016. 8.000 €. Investigador principal.
- 4 **Proyecto.** Novel approaches to promote the sustainability of olive cultivation in the Mediterranean. Programa PRIMA de la Unión Europea. Roberto García Ruiz. (Universidad de Jaén). Desde 14/01/2019.
- 5 **Proyecto.** AGR-6131, MODELADO Y CONTROL DE SECADERO ROTATIVO DE ORUJO. Junta de Andalucía. Desde 09/02/2011. 159.807,61 €.
- 6 **Proyecto.** AGR-6509, PRODUCCIÓN DE BIOCOMBUSTIBLES UTILIZANDO HUESO DE ACEITUNA Y RESIDUOS DE PODA DE OLIVO. JUNTA ANDALUCÍA. SEBASTIÁN SÁNCHEZ VILLASCLARAS. Desde 09/02/2011. 179.978,6 €.
- 7 **Proyecto.** 0624059511 IBP 64021, BIOMASA DEL OLIVAR: UNA APROXIMACIÓN MATEMÁTICA. JUAN MARTINEZ MORENO. Desde 01/01/2007. 4.494 €.
- 8 **Proyecto.** 06.22.05.55.31 IBP, MODELOS MATEMÁTICOS EN LA HIDRÓLISIS DEL RESIDUO DE PODA DE OLIVO. ALBERTO J. MOYA LÓPEZ. Desde 01/01/2007. 11.000 €.
- 9 **Proyecto.** PID77A, SISTEMA ONLINE DE APOYO A LAS TUTORIAS. JOSE MARIA QUESADA TERUEL. Desde 01/12/2006. 1.800 €.
- 10 **Contrato.** Extracción de aceites de oliva con el sistema Abencor y caracterización del fruto en muestras de aceituna. Estudio de su evolución con el índice de madurez Fraile Llanos del Castillejo SL. Sebastián Sánchez Villasclaras. 02/11/2018-17/01/2019. 861,11 €.
- 11 **Contrato.** Caracterización funcional de la hoja de olivo para su posible valorización de diferentes usos industriales Agrícola El Rubio SCA. 23/04/2018-22/11/2018. 1.667 €.
- 12 **Contrato.** CARACTERIZACIÓN Y DETERMINACIÓN DE ÁCIDO BUTANOICO EN AGUAS DE PROCESOS Smurfit Kappa España SA. SEBASTIÁN SÁNCHEZ VILLASCLARAS. 09/05/2017-31/07/2017.
- 13 **Contrato.** DESARROLLO DE PROYECTOS SOBRE VALORIZACIÓN DE HOJA DE OLIVO COMO INGREDIENTE NUTRICIONAL EN ALIMENTACIÓN CAPRINA Y PORCINA OLEOSTEPA, SDAD. COOP. AND.. SEBASTIÁN SÁNCHEZ VILLASCLARAS. 03/11/2015-29/06/2016. 19.727,78 €.

### C.5. Estancias en centros de I+D+i públicos o privados

- 1 Università degli Studi di Perugia - Centro di Ricerca Sulle Biomasse. Italia. Perugia. 17/12/2021-17/02/2022. 2 meses. Posdoctoral.
- 2 Università degli Studi di Perugia - Centro di Ricerca Sulle Biomasse. Italia. Perugia. 04/11/2021-04/12/2021. 1 mes. Posdoctoral.
- 3 UNIVERSIDAD DE SÃO PAULO. DEPARTAMENTO DE BIOTECNOLOGIA. ESCOLA DE ENGENHARIA. Brasil. LORENA. 15/06/2011-15/09/2011. 92 días. Posdoctoral.





## CURRICULUM VITAE (CVA)

**IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.**

### Part A. PERSONAL INFORMATION

CV date 28/1/2023

First name	Pedro Antonio		
Family name	González	Moreno	
Gender (*)		Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail	pagonza@ual.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)	0000-0001-7189-1507		

(\*) Mandatory

#### A.1. Current position

Position	Associate Professor of Chemical Engineering		
Initial date	20/11/2011		
Institution	University of Almería		
Department/Center	Chemical Engineering	Higher Engineering School	
Country	Spain	Teleph. number	+34951015066
Key words	Microalgae lipids, lipid extraction, lipase catalyzed reactions		

#### A.2. Previous positions (research activity interruptions, art. 14.2.b))

Period	Position/Institution/Country/Interruption cause

#### A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Graduate of Chemical Sciences	University of Granada / Spain	1998
Doctor of Chemical Engineering (PhD)	University of Almería / Spain	2002

### Part B. CV SUMMARY (max. 5000 characters, including spaces)

#### General indicators of quality of scientific production:

- Three six-year research periods (3 “sexenios”)
- Last six-year term granted in 2019 (corresponding to the 2013-2018 period)
- Participation in 4 research projects (National Research Plans) as research team member
- 2 doctoral theses directed in the last 10 years
- Total citations: 1865 of 39 works in Scopus
- Total publications in the first quartile: 23 of 37 (to 2021), 15 of 21 (from 2010 to 2021)
- h index: 26 (Scopus)





My research career is summarized in the following lines:

1. Spray Drying of Whey Protein Concentrates (WPC)
2. Synthesis of DNAs with catalytic activity (DNAzymes)
3. Obtaining biodiesel from microalgae through chemical and enzymatic processes
4. Production of high value lipids for the food and pharmaceutical industry from microalgae and fish oils. Enzymatic technology application to fatty acid profile modifications. In this line, the following objectives can be highlighted:
  - 4.1. Synthesis of structured lipids catalyzed by immobilized lipases
  - 4.2. Production of  $\omega$ -3 PUFAs concentrates (long chain polyunsaturated fatty acids, mainly EPA and DHA) from fish oils using acyl-selective lipases
  - 4.3. Production of rich  $\omega$ -3 polar lipids from marine microalgae
5. Computational fluid dynamics for the design of bioactive-producing microalgae photobioreactors

The first line corresponds to my final postgraduate work, in which a model to simulate WPC drying by atomization was proposed. In this line I acquired my initial training as researcher.

The second line is the result of a 22-month postdoctoral stay at the Massachusetts Institute of Technology (MIT) in the group of Professor Klibanov, a pioneer in the field of enzymatic transformations in non-aqueous media, where I worked on the implementation of an innovative project on the synthesis and selection of DNA with catalytic properties. In a first work, results were published on the peroxidase activity of an 18-base DNA on substrates with different steric hindrances.

In the third line, the obtaining of biodiesel (fatty acid methyl esters) from microalgal lipids was studied. The extraction of saponifiable lipids from microalgae, the extraction of these lipids as free fatty acids and the direct transesterification of fatty acids in the microalgal biomass were tested; in the three cases, the lipids or fatty acids were transformed into biodiesel through reactions catalyzed by acids or lipases. Among the results obtained, the direct transesterification method catalyzed with sulfuric acid can be highlighted; this process had few stages and gave biodiesel yield and purity of 100% and 80%, respectively.

In the fourth line, I did my doctoral thesis. The first objective (4.1) was to obtain glycerides with a determined distribution and composition of fatty acids. In particular, specific 1,3 lipases were used to synthesize, for example, structured triglycerides rich in caprylic acid at positions 1 and 3, and PUFAs (EPA or DHA) at position 2 (central) of the glyceride. The mechanisms and kinetics of these complex reactions (transesterifications, both acidolysis and alcoholysis), and their implementation in different types of reactors, such as packed bed reactors, were studied, among other aspects. The next objective (4.2) was to achieve EPA or DHA concentrates in the form of glycerides using reactions catalyzed by lipases, especially alcoholysis reactions in which lipases showed acyl-selectivity for fatty acids other than  $\omega$ -3 PUFAs, so EPA or DHA were concentrated in original glycerides. Thus, for example, glycerides with 70% DHA were obtained starting from tuna oil (22% DHA). In addition, methods for the purification of these  $\omega$ -3 rich glycerides by both liquid-liquid extraction and molecular distillation were also developed. The last objective (4.3), currently in progress, is the extraction and purification of polar lipids from microalgae. Microalgal polar lipids have an EPA or DHA high content, but it is possible to further increase the PUFA content by enzymatic reactions. Fractions with up to 98% polar lipids and 42% EPA have already been obtained, recovering in them up to 87% of the polar lipids and 73% of the EPA contained in the original microalgal biomass.

Throughout my research trajectory, a significant amount of knowledge has been established in the extraction of lipids from microalgae and their transformation through enzymatic reactions, which are key aspects to successfully carry out the project requested.

## Part C. RELEVANT MERITS (*sorted by typology*)

### C.1. Publications

Line 4.3 Obtaining of  $\omega$ -3 PUFAs rich polar lipids:

- Sánchez, M.D.M., Callejón, M.J.J., Medina, A.R., P.A. González Moreno, (...), Grima, E.M. Obtaining EPA-rich polar lipids from microalga *Nannochloropsis* sp. by silica-gel chromatography using non-toxic solvents. *Biomass Conversion and Biorefinery* (2022), In Press. <https://doi.org/10.1007/s13399-022-02520-2>
- M.J. Jiménez Callejón, A. Robles Medina, P.A. González Moreno, M.D. Macías Sánchez, E. Navarro López, L. Esteban Cerdán, E. Molina Grima. Supercritical fluid extraction and pressurized



liquid extraction processes applied to eicosapentaenoic acid-rich polar lipid recovery from the microalga *Nannochloropsis* sp. *Algal Research* (2022), 61, 102586.

<https://doi.org/10.1016/j.algal.2021.102586>

- M.J. Jiménez Callejón, A. Robles Medina, P.A. González Moreno, L. Esteban Cerdán, S. Orta Guillén, E. Molina Grima. Simultaneous extraction and fractionation of lipids from the microalga *Nannochloropsis* sp. for the production of EPA-rich polar lipid concentrates. *Journal of Applied Phycology*, 32, 1117-1128 (2020). <https://doi.org/10.1007/s10811-020-02037-z>
- María J. Jiménez Callejón, Alfonso Robles Medina, María D. Macías Sánchez, Luis Esteban Cerdán, Pedro A. González Moreno, Elvira Navarro López, Emilio Molina Grima. Obtaining highly pure EPA-rich lipids from dry and wet *Nannochloropsis gaditana* microalgal biomass using ethanol, hexane and acetone. *Algal Research*, 45, 101729. (2020). <https://doi.org/10.1016/j.algal.2019.101729>

Line 4.2 Concentration of PUFAs by enzymatic reactions:

- Martín Valverde, L., González Moreno, P.A. Cerdán, L.E., López, E.N., Robles Medina, A. Concentration of docosahexaenoic acid by enzymatic alcoholysis with different acyl-acceptors, using tert-butanol as reaction medium. *Journal of Molecular Catalysis B: Enzymatic*. 120, 3202, 165-172 (2015). <https://doi.org/10.1016/j.molcatb.2015.07.010>
- L. Martín Valverde, P.A. González Moreno, L. Esteban Cerdán, E. Navarro López, B. Castillo López, A. Robles Medina Concentration of docosahexaenoic and eicosapentaenoic acids by enzymatic alcoholysis with different acyl-acceptors. *Biochemical Engineering Journal*. 91, 163-173 (2014). DOI: <http://dx.doi.org/10.1016/j.bej.2014.08.010>.
- L. Martín Valverde, P.A. González Moreno, M.J. Jiménez Callejón, L. Esteban Cerdán, A. Robles Medina. Concentration of eicosapentaenoic acid by selective alcoholysis catalyzed by lipases. *European Journal of Lipid Science and Technology*. 115, 990-1004 (2013) <https://doi.org/10.1002/ejlt.201300005>.
- L. Martín Valverde, P.A. González Moreno, A. Rodríguez Quevedo, E. Hita Peña, M.J. Jiménez Callejón, L. Esteban Cerdán, E. Molina Grima, A. Robles Medina (2012) Concentration of Docosahexaenoic acid (DHA) by Selective Alcoholysis Catalyzed by Lipases. *Journal of the American Oil Chemists' Society*. 89, 1633-1645. <http://dx.doi.org/10.1007/s11746-012-2056-4>.

Line 4.1 Synthesis of structured lipids by enzymatic reactions:

- L. Esteban Cerdán, M.J. Jiménez Callejón, E. Hita Peña, P.A. González, L. Martín Valverde, A. Robles Medina. Production of structured triacylglycerols rich in palmitic acid at sn-2 position and oleic acid at sn-1,3 positions as human milk fat substitutes by enzymatic acidolysis. *Biochemical Engineering Journal*. 54, 62- 69 (2011). <https://doi.org/10.1016/j.bej.2011.01.009>
- A. Robles Medina, M.J. Jiménez, L. Esteban Cerdán, P.A. González, L. Martín Valverde, A. Rodríguez Quevedo, E. Molina Grima. Enzymatic production of human milk fat substitute containing palmitic and docosahexaenoic acids at sn-2 position and oleic acid at sn-1,3 positions. *LWT-Food Science and Technology*. 44, 1986-1992 (2011). <https://doi.org/10.1016/j.lwt.2011.05.022>

Line 3. Obtaining of biodiesel from microalgae by acid and enzymatic catalysis:

- E. Navarro López, A. Robles Medina, P.A. González Moreno, L. Esteban Cerdán, L. Martín Valverde, E. Molina Grima. Biodiesel production from *Nannochloropsis gaditana* lipids through transesterification catalyzed by *Rhizopus oryzae* lipase. *Bioresource Technology*, 203, 236-244 (2016). <https://doi.org/10.1016/j.biortech.2015.12.036>
- E. Navarro López, A. Robles Medina, L. Esteban Cerdán, P.A. González Moreno, M.D. Macías Sánchez, E. Molina Grima. Fatty acid methyl ester production from wet microalgal biomass by lipase-catalyzed direct transesterification. *Biomass and Bioenergy*, 93, 6-12 (2016). <https://doi.org/10.1016/j.biombioe.2016.06.018>
- M.D. Macías-Sánchez, A. Robles-Medina, E. Hita-Peña, M.J. Jiménez-Callejón, L. Esteban-Cerdán, P.A. González-Moreno, E. Molina-Grima Biodiesel production from wet microalgal biomass by direct transesterification. *Fuel*, 150, 14-20 (2015). <http://dx.doi.org/10.1016/j.fuel.2015.01.106>
- E. Navarro López, A. Robles Medina, P.A. González Moreno, M.J. Jiménez Callejón, L. Esteban Cerdán, L. Martín Valverde, B. Castillo López, E. Molina Grima. Enzymatic production of biodiesel from *Nannochloropsis gaditana* lipids: influence of operational variables and polar lipid content. *Bioresource Technology*, 187, 346-353 (2015). <http://dx.doi.org/10.1016/j.biortech.2015.03.126>
- E. Hita Peña, A. Robles Medina, M.J. Jiménez Callejón, M.D. Macías Sánchez, L. Esteban Cerdán, P.A. González Moreno, E. Molina Grima. Extraction of free fatty acids from wet *Nannochloropsis*



*gaditana* biomass to produce biodiesel. *Renewable Energy*, 75, 366-373 (2015). <https://doi.org/10.1016/j.renene.2014.10.016>

- M.J. Jiménez Callejón, A. Robles Medina, M.D. Macías Sánchez, E. Hita Peña, L. Esteban Cerdán, P.A. González Moreno, E. Molina Grima. Extraction of saponifiable lipids from wet microalgal biomass for biodiesel production. *Bioresource Technology*. 169, 198-205 (2014). <https://doi.org/10.1016/j.biortech.2014.06.106>

## C.2. Congress

- MJ. Jimenez-Callejon, A. Robles-Medina, MD. Macias-Sanchez, PA. Gonzalez-Moreno, E. Navarro-López, L. Esteban-Cerdan and E. Molina-Grima. Supercritical Fluid Extraction and Pressurized Liquid Extraction Processes Applied to EPA-rich Polar Lipid Recovery from the Microalga *Nannochloropsis* sp. Nanotech / Biotech France 2021 and Joint Virtual Conferences 23 - 25 June, 2021.
- M.J. Jiménez, M.D. Macías, A. Robles, P.A. González, L. Esteban and E. Molina Production of EPA rich polar lipid concentrates from microalgae *Nannochloropsis* sp. VIII research symposium in experimental sciences. University of Almería. November 2019.
- M.J. Jiménez, M.D. Macías, J.M. Delgado, A. Robles, P.A. González, L. Esteban and E. Molina. Production of Highly Pure Lipids and Polar Lipids Concentrates Rich in EPA from Microalgae *Nannochloropsis*. Poster. 7th Euro Fed Lipid Congress and Expo. Sevilla, Spain. 20 - 23 October, 2019
- M.J. Jiménez Callejón, A. Robles Medina, P.A. González Moreno, L. Esteban Cerdán, E. Molina Grima. Simultaneous extraction and fractionation of lipids from the marine microalga *Nannochloropsis* sp. for the production of EPA rich polar lipid concentrates. Poster. BIOTEC 2019. National Congress of Biotechnology. Vigo, Spain. June, 2019

## C.3. Research projects

- UAL2020-BIO-A2078. Dinámica de fluidos computacional acoplada a modelos biológicos para el diseño de fotobiorreactores adaptados a microalgas productoras de bioactivos. Ayudas I+D+I en Universidades y Centros de Investigación Públicos. UAL-Feder 2020. 01-01-2021 to 31-12-2022. 30000 €
- CTQ2017-85613-R. Enzymatic technology applied to the production of new concentrates of polar lipids from microalgae enriched in EPA and DHA. Ministry of Science, Innovation and Universities. Participation as researcher. 1-1-2018 to 31-12-2020. 133.100 €
- CTQ2010-16931. Biodiesel production by lipase catalysed transesterification reactions. Ministry of Science and Innovation. Participation as researcher. 1-1-2011 to 31-12-2013. 159.720 €
- CTQ2007-64079. Obtaining and purification of structured triacylglycerols (STAG), polyunsaturated fatty acids (PUFAs) and PUFA enriched acylglycerols. Ministry of Science and Technology. Participation as researcher. 2007-2010. 176.176 €

## C.4. Contracts, technological or transfer merits

- Capture of CO<sub>2</sub>, fixation and valorization of biomass by photosynthetic microorganisms in the thermal power plant of the coast (Carboneras, Spain). Plan E Biofuels and CO<sub>2</sub>. Endesa Generación, Innovamar and Aitemín Technological Centre. Ministry of Science and Innovation and Spanish Oceanographic Institute. IP Emilio Molina Grima (University of Almería). 6-9-2010 - 31-12-2011. 389.000 €.
- Renewable Energies and Clean Combustion (Novare CO<sub>2</sub>, Ref.-00905). Endesa. IP Emilio Molina Grima (University of Almería). 14-7-2010, 3 years. 499.999,99 €.
- Conference or seminar: Development of a Process for Microalgal Biofuel: Science, Engineering and Economic Assessment. Almería (España), 2011  
Presentation title: Extraction pre-treatments for microalgal lipid extraction  
Organizing Institution: Campus de Excelencia Internacional Agroalimentario (CEIA3).





**CURRICULUM VITAE (CVA)**

CV date

26/09/2023

**Part A. PERSONAL INFORMATION**

First name	Martín Lara		
Family name	María Ángeles		
Gender (*)		Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail	marianml@ugr.es	URL Web	
Open Research and Contributor ID (ORCID)(*)	0000-0001-9515-7307		

(\*) *Mandatory*

**A.1. Current position**

Position	Full Professor – Reader in Chemical Engineering		
Initial date	12/07/2023		
Institution	University of Granada		
Departament/Center	Chemical Engineering Departament / Faculty of Sciences		
Country	Spain	Teleph. number	+34958240445
Key words	Adsorption / Thermochemical processes / Residual biomass / Plastic waste / Industrial by-products / Waste and biomass valorization / Recycling / Value added compounds / Biosorbents		

**A.2. Previous positions (research activity interruptions, art. 45.2.c))**

Period	Position/Institution/Country/Interruption cause
01/12/2004 – 30/11/2008	Researcher in training, Full Time dedication, University of Granada (Granada, Spain)
30/01/2009 – 30/11/2008	Assistant Professor - Lecturer, Pablo de Olavide University (Sevilla, Spain)
28/09/2009 – 07/05/2012	Assistant Professor - Lecturer, University of Granada (Granada, Spain)
08/05/2012 – 23/07/2012	Associate Professor (Profesora Contratada Doctora) - Lecturer, University of Granada (Granada, Spain)
24/07/2012 – 12/07/2023	Associate Professor (Profesora Titular) – Lecturer, University of Granada (Granada, Spain)

**A.3. Education**

PhD, Licensed, Graduate	University/Country	Year
Chemical Engineering - Licensed	University of Granada	2004
Industrial Engineering - Graduate	University of Jaén	2008
Chemical Engineering - PhD	University of Granada	2008

**Part B. CV SUMMARY**

Chemical Engineer from the University of Granada in 2004, Industrial Technical Engineer from the University of Jaén in 2008 and a PhD from the University of Granada in 2008. Since 2023 she is Full Professor of the University of Granada attached to the Department of Chemical Engineering where she is dedicated to the characterization, treatment, and recovery of solid waste. Specifically, she has extensive experience in the characterization of solid agricultural, forestry and agro-industrial wastes such as olive stone, olive pruning or almond husk. She has



also investigated the possible recovery of agricultural, forestry and agro-industrial waste through thermochemical processes and hydrothermal processes to obtain biofuels and chemical compounds of interest. A large part of her research career has been focused on the study of new wastewater treatment technologies applying residual biomass for the removal of heavy metals from industrial aqueous effluents. In this sense, she domain the methodology to obtain the high-quality experimental information necessary for the development of mathematical models capable of reproducing the bioadsorption process developed both in batch (batch reactors) and in continuous (dynamic operation in fixed bed columns). She has also analyzed the reuse of bioadsorbents in consecutive adsorption-desorption cycles. Currently, she is involved in four great research lines: 1) research into microplastics and plastic pollution; 2) research in thermochemical conversion processes (biomass gasification, tar reforming, plastic pyrolysis, biomass torrefaction, etc.); 3) research in hydrothermal treatment for the pretreatment of a wide range of biomass feedstocks; 4) treatment of waste from extraction and processing of mineral resources.

Regarding project management, she was principal researcher of more than 10 projects. Also, she is the principal researcher of several contracts with companies related to the thermochemical processing of biomass, plastic recycling, and treatment of waste from extraction and processing of mineral resources.

Regarding supervision of Doctoral Thesis, she has supervised seven doctoral theses and is now supervising other 4 about recycling of dirty non-recyclable plastic.

Finally, as a global result, M.A. Martín-Lara has a total of 129 JCR publications broken down as follows: 78 Q1 (37 in the first decile), 31 Q2, 12 Q3, 8 Q4, a total of 3789 citations by 2943 documents and an h-index of 38 (according to Scopus).

**Part C. RELEVANT MERITS**

**C.1. Publications**

*(Selection of papers published in 2019, 2020, 2021 and 2022)*

- Paucar-Sánchez, M.F.; Calero, M.; Blázquez, G.; Solís, R.R.; Muñoz-Batista, M.J.; Martín-Lara, M.A. Thermal, and catalytic pyrolysis of a real mixture of post-consumer plastic waste: An analysis of the gasoline-range product. *Process Safety and Environmental Protection* 168, 1201-1211 (2022).
- Martín-Lara, M.A.; Moreno, J.A.; Garcia-Garcia, G.; Arjandas, S.; Calero, M. Life cycle assessment of mechanical recycling of post-consumer polyethylene flexible films based on a real case in Spain. *Journal of Cleaner Production* 365, 132625 (2022).
- Muñoz-Batista, M.J., Blázquez, G., Franco, J.F., Calero, M., Martín-Lara, M.A. Recovery, separation and production of fuel, plastic, and aluminum from the Tetra PAK waste to hydrothermal and pyrolysis processes. *Waste Management* 137, 179-189 (2022).
- Martín-Lara, M.A., Godoy, V., Quesada, L., Lozano, E.J., Calero, M. Environmental status of marine plastic pollution in Spain. *Marine Pollution Bulletin* 170,112677 (2021).
- Martín-Lara, M.A., Piñar, A., Ligeró, A., Blázquez, G., Calero, M. Characterization and use of char produced from pyrolysis of post-consumer mixed plastic waste. *Water* 13(9), 1188 (2021).
- Gálvez-Pérez, A., Martín-Lara, M.A., Calero, M., (...), Canu, P., Blázquez, G. Experimental investigation on the air gasification of olive cake at low temperatures. *Fuel Processing Technology* 213, 106703 (2021).
- Fernández-González, R.; Martín-Lara, M.A.; Blázquez, G.; Tenorio, G.; Calero, M. Hydrolyzed olive cake as novel adsorbent for copper removal from fertilizer industry wastewater. *Journal of Cleaner Production* 268, 121935 (2020).
- Soto, J.M.; Martín-Lara, M.A.; Blázquez, G., (...); Quesada, L.; Calero, M. Novel pre-treatment of dirty post-consumer polyethylene film for its mechanical recycling. *Process Safety and Environmental Protection* 139, 315-324 (2020).

Firma (1): MARÍA CARMEN RODRÍGUEZ ROMERO  
En calidad de: Solicitante



- Iáñez-Rodríguez, I., Calero, M., Blázquez, G., Martín-Lara, M.A. Greenhouse crop residue and its derived biochar: Potential as adsorbent of cobalt from aqueous solutions. *Water* 12, 1282 (2020).
- Quesada, L.; Calero, M.; Martín-Lara, M.A.; Pérez, A.; Blázquez, G. Characterization of fuel produced by pyrolysis of plastic film obtained of municipal solid waste. *Energy* 186, 115874 (2019).
- Martín-Lara, M.A.; A. Pérez; M.A. Vico-Pérez; M. Calero; G. Blázquez. The role of temperature on slow pyrolysis of olive cake for the production of solid fuels and adsorbents. *Process Safety and Environmental Protection*, 121, 209-220 (2019).
- Iáñez-Rodríguez, I., Martín-Lara, M.Á., Blázquez, G., Osegueda, Ó., Calero, M. Thermal analysis of olive tree pruning, and the by-products obtained by its gasification and pyrolysis: The effect of some heavy metals on their devolatilization behavior. *Journal of Energy Chemistry* 32, 105-117 (2019).

## C.2. Congress

(Selection of five contributions of the last years – 2020 and 2021)

- Calero, M.; Martín-Lara, M.A.; Pérez, A.; Blázquez, G.; Muñoz, M.; Arjandas, S.; Lozano, E. Plastic mix recycling from municipal solid waste: characterization of raw material. Oral Communication. SUM2020 - Fifth Symposium on Urban Mining and Circular Economy. 18-20/11/2020. Virtual Meeting.
- Godoy, V.; Martín-Lara, M.A.; Blázquez, G.; Calero, M. Influence of pH and temperature on the adsorption/desorption capacity of microplastics. Oral Communication. International Conference MICRO2020. Fate and Impacts of Microplastics: Knowledge and Responsibilities. 23-27/11/2020. Virtual Meeting.
- Martín-Lara, M.A.; Blázquez, G.; Piñar, A.; Paucar, M.F.; Calero, M. Turning non-recyclable mixed plastic from municipal solid waste into valuable chemicals and carbon materials (VALORPLASTIC). Oral Communication. 24th International Congress of Chemical and Process Engineering CHISA 2021. 15-18/03/21. Virtual Meeting.
- Martín-Lara, M.A.; Blázquez, G.; Pérez, A.; Muñoz, M.J.; Moreno, J.A.; Arjandas, S.; Calero, M. Life cycle assessment of mechanical recycling of post-consumer polyethylene flexible films based on a real case in Spain. Poster presentation. 24th International Congress of Chemical and Process Engineering CHISA 2021. 15-18/03/21. Virtual Meeting.
- Paucar-Sánchez, M.F.; Calero, M.; Blázquez, G.; Muñoz-Batista, M.J.; Martín-Lara, M.A. Characterization of liquid fraction obtained from pyrolysis of post-consumer mixed plastic waste. Poster presentation. RECUWASTE2021. 26-27/10/2021. Mataró, Barcelona (Spain).
- Calero, M.; Ligeró, A.; Blázquez, G.; Pérez, A.; Muñoz-Batista, M.J.; Martín-Lara, M.A. Aprovechamiento del char obtenido en la pirólisis de residuos plásticos como adsorbente de CO<sub>2</sub>. Oral communication. RECUWASTE2021. 26-27/10/2021. Mataró, Barcelona (Spain).

## C.3. Research projects

- Reference: PID2022-139014OB-I00. Call: Ministry of Science and Innovation. Project title: Desarrollo de un proceso para producir hidrógeno a partir de plásticos no reciclables de residuos municipales. Duration: Not available; Budget: 137.500 €. Principal researchers: M. Calero / M.J. Muñoz-Batista.
- Reference: PDC2022-133808-I00. Call: Ministry of Science and Innovation – R+D+i Projects Proof of Concept 2022 (Recovery, Transformation and Resilience Plan). Project title: Adsorbentes de bajo coste preparados a partir de residuos plásticos orientados a la separación de CO<sub>2</sub> de biogás (ADSORCHAR). Duration, from: 01/12/2022 to: 31/12/2024; Budget: 115000 €. Principal researchers: M. Calero / M.A. Martín-Lara.



- Reference: TED2021-130157B-I00. Call: Ministry of Science and Innovation – R+D+i Projects oriented to the Ecological Transition and the Digital Transition (Recovery, Transformation and Resilience Plan). Project title: Desarrollo de un material carbonoso de bajo coste a partir del char de pirólisis de residuos plásticos post-consumo y su aplicación a la depuración de efluentes (CARBOPLASTIC). Duration, from: 01/12/2022 to: 31/12/2024; Budget: 129950 €. Principal researchers: M. Calero / M.A. Martín-Lara.
- Reference: CPP2021-008551. Call: Ministry of Science and Innovation – R+D+i Public private collaboration projects (Recovery, Transformation and Resilience Plan). Project title: Desarrollo de materiales de carbono de bajo costo para aplicaciones agroambientales en el marco de economía circular y mitigación del cambio climático (AGROMICAT). Duration, from: 01/07/2022 to: 31/12/2024; Budget: 1255474 €. Principal researchers: M. Calero / M.A. Martín-Lara.
- Reference: B-RNM-78-UGR20. Call: R&D&i projects of the Andalusian ERDF 2014-2020 Operational Program. Project title: Valorización de residuos plásticos procedentes de la fracción rechazo de las plantas de tratamiento de residuos sólidos urbanos mediante pirólisis (PYROMIX1). Duration, from: 01/07/2021 to: 30/06/2023; Budget: 40000 €. Principal researchers: M. Calero / M.A. Martín-Lara.
- Reference: Call: R&D&i Projects «Research Challenges» of Ministry of Science and Innovation. Project title: Turning non-recyclable mixed plastic from municipal solid waste into valuable chemicals and carbon materials (VALORPLASTIC). Duration, from: 30-07-2020 to: 30-07-2023. Budget 108900 €. Principal researchers: M. Calero / M.A. Martín-Lara.
- Reference: LIFE18 ENV/ES/000256. Call: LIFE Programme (EU's funding instrument for the environment and climate action). Project title: Integral management of the biogas from landfills for use as vehicle fuel (LANDFILL BIOFUEL). Duration, from: 01-07-2019 to: 30-06-2023. Budget 2466777 €. Principal researcher (UGR): M. Calero.

#### C.4. Contracts, technological or transfer merits

*(Only the last contracts directly linked with the proposal)*

- Contrat title: Assistance and technical support in the field of waste management. Company: Soluciones Ambientales Granada S.L. Duration, from: 13-02-2021 until 12-02-2023. Principal researchers: M. Calero / M.A. Martín-Lara. Number of researchers: 5. Total contract budget: Open contract
- Contrat title: Assistance and technical support for the R&D&i center of FCC MEDIO AMBIENTE SA in Granada and the R&D&i projects of FCC MEDIO AMBIENTE SA. Company: FCC Medio Ambiente S.A. Duration, from: 17-10-2019 until 17-10-2021. Principal researchers: M. Calero / M.A. Martín-Lara. Number of researchers: 2. Total contract budget: 3203.75 €
- Contrat title: Assistance and technical support for the assessment about the use of biomass for energy purposes. Company: Vertex Life S.L. Duration, from: 10-03-2021 until 09-03-2022. Principal researchers: M. Calero / A. Pérez. Number of researchers: 5. Total contract budget: 6991.11 € (open contract)
- Contrat title: Assistance and technical support for a plastic waste valorization plant. Company: INGESIA Ingeniería y Medioambiente, S.L. Duration, from: 04-09-2017 until 04-09-2018. Principal researchers: M. Calero / M.A. Martín-Lara. Number of researchers: 4. Total contract budget: 7044.92 €
- Contrat title: Research work, assistance, and technical support for a project of a plastic waste recovery plant. Company: STUC Gestión de Obras S.L. Duration, from: 01-01-2017 until: 31-12-2018. Principal researchers: M. Calero / G. Blázquez. Number of researchers: 4. Total contract budget: 30458.00 €



**CURRICULUM VITAE ABREVIADO (CVA)**

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Fecha del CVA	01/10/2023
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**Parte A. DATOS PERSONALES**

Nombre	M <sup>a</sup> del Mar		
Apellidos	Muñío Martínez		
Sexo (*)		Fecha de nacimiento (dd/mm/yyyy)	
DNI, NIE, pasaporte	-T		
Dirección email	mmunio@ugr.es	URL Web	-
Open Researcher and Contributor ID (ORCID) (*)	0000-0001-9745-9771		

\* *datos obligatorios*

**A.1. Situación profesional actual**

Puesto	Profesora Titular de Universidad		
Fecha inicio	03/11/2018		
Organismo/ Institución	Universidad de Granada		
Departamento/ Centro	Departamento de Ingeniería Química / Instituto del Agua		
País	España	Teléfono	958240532
Palabras clave	Tratamiento de aguas residuales, industria alimentaria, usos y tratamiento de aceite		

**A.2. Situación profesional anterior (incluye interrupciones en la carrera investigadora, de acuerdo con lo indicado en la convocatoria, indicar meses totales)**

Periodo	Puesto/ Institución/ País / Motivo interrupción
2018-actualidad	Profesora Titular de Universidad/ Universidad de Granada/España
2015-2018	Profesora Contratada Doctora Indefinida/Universidad de Granada/España
2010-2015	Profesora Ayudante Doctora/Universidad de Granada/España
2009-2010	Profesora Sustituta Interina/Universidad de Granada/España
2008	Personal Apoyo Técnico a la Investigación/Universidad de Granada/España
2004-2008	Becaria FPI/Universidad de Almería/España

(Incorporar todas las filas que sean necesarias)

**A.3. Formación Académica**

Grado/Master/Tesis	Universidad/País	Año
Doctora por la Universidad de Almería (Doctorado Europeo)	Universidad de Almería	2008
Ingeniera Técnica Industrial	Universidad de Jaén	2008
Ingeniera Química	Universidad de Granada	2003

(Incorporar todas las filas que sean necesarias)





**Parte B. RESUMEN DEL CV (máx. 5.000 caracteres, incluyendo espacios): *MUY IMPORTANTE: se ha modificado el contenido de este apartado para progresar en la adecuación a los principios DORA. Lea atentamente las "Instrucciones para cumplimentar el CVA"***

Acerca de mi formación académica, me gustaría destacar que dispongo de dos titulaciones universitarias, Ingeniería Química por la Universidad de Granada en febrero de 2003 e Ingeniería Técnica Industrial por la Universidad de Jaén en enero de 2008. Desde el año 2004 al año 2008 disfruté de una beca FPI del Ministerio de Educación y Ciencia. Obtuve el doctorado por la Universidad de Almería en septiembre de 2008, con la calificación de Sobresaliente Cum Laude y la mención de Doctorado Europeo para lo cual realicé una estancia de 6 meses de duración en la Universidad de Lund, Suecia, supervisada por el Profesor Patrick Adlercreutz, en el año 2006. Durante la estancia realicé estudios sobre la oxidación de ácidos grasos poliinsaturados procedentes de aceite de pescado. La tesis doctoral se titula "Obtención de triacilglicéridos estructurados mediante alcoholisis y esterificación enzimáticas". En cuanto al nivel de inglés obtuve el First Certificate (B2) en 2005 con una calificación de B. Además, he realizado numerosos cursos de especialización posdoctorales como son el de Utilización de herramientas informáticas para la investigación, Uso de inglés técnico, etc.

En cuanto a la actividad científica, quiero comentar que desde el año 2004 he participado en 9 proyectos de investigación de convocatoria pública relacionados con la industria alimentaria y el tratamiento de aguas, siete de ellos nacionales y dos autonómicos. En uno de ellos, relacionado con el tratamiento de aguas y valorización de la biomasa algal, he sido IP. También he participado en 11 contratos de investigación con empresas punteras relacionadas tanto con la industria alimentaria como con el tratamiento de aguas residuales. Tanto los proyectos de investigación como los contratos de investigación se han llevado a cabo en la Universidad de Almería o en la Universidad de Granada, con colaboraciones público-privadas. Todo ello fundamenta mi contribución a la generación de conocimiento y aportaciones a la sociedad.

Los resultados obtenidos de las actividades financiadas de forma pública y privada mencionadas anteriormente han dado lugar a 47 publicaciones en revistas internacionales (indexadas en JCR), entre las que destacan 27 en el sector del tratamiento de aguas. Así como un libro y varios capítulos de libro sobre el mismo tema. Más del 80% de las publicaciones se encuentran indexadas en el primer y segundo cuartil de JCR y cuento con alrededor de 800 citas en total, con un índice H de 17, además cuento con otras publicaciones indexadas en otras bases de datos. Desde el año 2004 he participado en 30 congresos nacionales e internacionales, casi en su totalidad relacionados con la industria alimentaria.

En referencia a mis aportaciones en la formación de jóvenes investigadores, he sido directora de dos tesis doctorales, ambas con una calificación Sobresaliente "cum laude. Además, una de una de ellas con mención de doctorado internacional, de la cual se han publicado 7 artículos de investigación, y que obtuvo el Premio Extraordinario de Tesis de la UGR. Además, he dirigido TFM en diferentes Másteres oficiales de la UGR. Todos ellos con la calificación de Sobresaliente.

Por último, me gustaría mencionar que actualmente soy revisora de 8 revistas de investigación. He participado tribunales de defensa de Trabajos Fin de Máster y en tribunales de Tesis Doctoral, algunos de ellos relacionados con el tratamiento de aguas y valorización de subproductos.

**Parte C. LISTADO DE APORTACIONES MÁS RELEVANTES - Pueden incluir publicaciones, datos, software, contratos o productos industriales, desarrollos clínicos, publicaciones en conferencias, etc. Si estas aportaciones tienen DOI, por favor inclúyalo.**

**C.1. Publicaciones más importantes en libros y revistas con "peer review" y conferencias (ver instrucciones).**

1. Díaz, Verónica; Leyva-Díaz, Juan Carlos; Almécija, Mari Carmen; Poyatos, José Manuel; **Muñio-Martínez, María del Mar**, Martín-Pascual, Jaime. Microalgae bioreactor for nutrient

Firma (1): **MARÍA CARMEN RODRÍGUEZ ROMERO**  
En calidad de: Solicitante



- removal and resource recovery from wastewater in the paradigm of circular economy. *Bioresource Technology*, Volume 363, November 2022, Article number 127968
2. Antiñolo Bermúdez, Laura; Leyva Díaz, Juan Carlos; Martín Pascual, Jaime; **Muñio Martínez, María del Mar**; Poyatos, José Manuel. Study of the Potential for Agricultural Reuse of Urban Wastewater with Membrane Bioreactor Technology in the Circular Economy Framework. *Agronomy*, 2022, 12(8), 187
  3. Leyva-Díaz, J.C., **Muñio, M.D.M.**, Fenice, M., Poyatos, J.M. Respirometric method for kinetic modeling of ammonium-oxidizing and nitrite-oxidizing bacteria in a membrane bioreactor. 2020. *AIChE Journal* 66(8).
  4. Monteoliva-García, A., Martín-Pascual, J., **Muñio, M.M.**, Poyatos, J.M. Effects of carrier addition on water quality and pharmaceutical removal capacity of a membrane bioreactor – Advanced oxidation process combined treatment. 2020. *Science of the Total Environment* 708.
  5. Leyva-Díaz, J.C., Monteoliva-García, A., Martín-Pascual, J., **Muñio, M.M.**, García-Mesa, J.J., Poyatos, J.M. Moving bed biofilm reactor as an alternative wastewater treatment process for nutrient removal and recovery in the circular economy model. 2020. *Bioresource Technology* 299.
  6. Monteoliva-García, A., Martín-Pascual, J., **Muñio, M.M.**, Poyatos, J.M. Removal of carbamazepine, ciprofloxacin and ibuprofen in real urban wastewater by using light-driven advanced oxidation processes. 2019. *International Journal of Environmental Science and Technology* 16(10).
  7. Monteoliva-García, A., Martín-Pascual, J., **Muñio, M.M.**, Poyatos, J.M. Removal of a Pharmaceutical Mix from Urban Wastewater Coupling Membrane Bioreactor with Advanced Oxidation Processes. 2019. *Journal of Environmental Engineering (United States)* 145 (9).
  8. Monteoliva-García, A., Leyva-Díaz, J.C., López-López, C., Poyatos, J.M., **Muñio, M.M.**, Martín-Pascual, J. Heterotrophic kinetic study and nitrogen removal of a membrane bioreactor system treating real urban wastewater under a pharmaceutical compounds shock: Effect of the operative variables. 2019. *Water (Switzerland)* 11(9).

AC: autor de correspondencia; (nº x / nº y): posición / autores totales

Si aplica, indique el número de citas y promedio por año

**C.2. Congresos**, indicando la modalidad de su participación (conferencia invitada, presentación oral, póster)

1. Laura Antiñolo Bermúdez, Jaime Martín Pascual, **María del Mar Muñio Martínez**, and Jose Manuel Poyatos. Effect of the pharmaceuticals (diclofenac, ibuprofen and erythromycin) on the heterotrophic biomass of a membrane bioreactor in urban wastewater treatment. Comunicación oral. 39th IAHR World Congress—From Snow To Sea (2022). Granada. Spain.
2. Verónica Díaz Mendoza, Laura Antiñolo Bermúdez, José Manuel Poyatos Capilla, **María del Mar Muñio Martínez**, Jaime Martín Pascual. Estudio cinético del crecimiento de la biomasa algal en un fotobiorreactor de membrana para el tratamiento de aguas residuales. X Congreso Andaluz de Ciencias Ambientales. COANCIAM. 3 y 4 de noviembre 2022 (Sevilla).
3. Laura Antiñolo Bermúdez, Verónica Díaz Mendoza, Jaime Martín Pascual, **María del Mar Muñio Martínez**, José Manuel Poyatos Capilla. Tratamiento de agua residual urbana con biorreactor de membrana: requerimientos energéticos en planta piloto. X Congreso Andaluz de Ciencias Ambientales. COANCIAM. 3 y 4 de noviembre 2022 (Sevilla).
4. Juan Carlos Leyva-Díaz, Jaime Martín-Pascual, **María del Mar Muñio**, Massimiliano Fenice y José Manuel Poyatos. Comparison between a membrane bioreactor, a hybrid moving bed biofilm reactor-membrane bioreactor and a pure moving bed biofilm reactor-membrane bioreactor on membrane fouling. Comunicación oral. 1<sup>st</sup> International Conference on Ecology and Protection of marine and Freshwater Environments (ECOPROWATER)



**C.3. Proyectos o líneas de investigación en los que ha participado, indicando su contribución personal. En el caso de investigadores jóvenes, indicar líneas de investigación de las que hayan sido responsables .**

1. TED2021-130500B-I00. Regeneración de agua residual tratada y fijación de CO<sub>2</sub> mediante sistemas de microalgas y revalorización de la biomasa algal produciendo biodiesel con tecnología enzimática. Ministerio de Ciencia, Innovación Proyectos Orientados a La Transición Ecológica y a la Transición Digital 2021). Investigador principal: José Manuel Poyatos (Universidad de Granada) Desde: 01/12/2022 Hasta: 30/11/2024 N° total de meses: 24 Cuantía: 184.000 €. Tipo de participación: miembro del equipo de investigación.
2. PID2021-124740NB-I00. Eliminación sostenible de compuestos emergentes en aguas residuales urbanas mediante la combinación de sistemas de membrana, biopelícula y oxidación avanzada. Investigador principal: José Manuel Poyatos Capilla, Universidad de Granada. Ministerio de Ciencia e Innovación. Desde: 28/06/2022 Hasta: 31/08/2025 N° total de meses: 38 Cuantía: 90.750 €. Tipo de participación: miembro del equipo de investigación.
3. P.18-TP.4732. Producción de biodiesel mediante tecnología enzimática a partir de microalgas obtenidas durante la regeneración del agua y fijación del CO<sub>2</sub> procedente de una EDAR (REGEALGABIODIESEL). Consejería de Transformación Económica, Industria, Conocimiento y Universidades. Junta de Andalucía. 2018. Investigadora Principal: **M<sup>a</sup> del Mar Muñío Martínez**, Universidad de Granada. Inicio: 01/01/2020 – Finalización: 31/12/2022. Cuantía: 111.529.41 €. Tipo de participación: Investigadora principal
4. RTI2018-101270-B-I00. Sistemas avanzados para el tratamiento integral de compuestos emergentes en aguas residuales urbanas para su vertido sostenible al medio. Ministerio de Ciencia e Innovación. 2018. Investigador principal: José Manuel Poyatos Capilla. Inicio: 01/01/2019 – Finalización: 31/12/2021. Cuantía: 111.320 €. Tipo de participación: miembro del equipo de investigación.
5. P12-AGR-1993. Aprovechamiento integral de descartes de pesca: obtención de hidrolizados proteicos funcionales y lípidos estructurados con ácidos grasos poliinsaturados. Consejería de Economía, Innovación y Ciencia. Junta Andalucía, convocatoria 2012. Investigador Principal: A. Guadix Escobar, Universidad de Granada. Inicio: 30/01/2014 – Finalización: 30/01/2018. Cuantía 106.045€. Tipo de participación: miembro del equipo de investigación.

**C.4. Participación en actividades de transferencia de tecnología/conocimiento y explotación de resultados** *Incluya las patentes y otras actividades de propiedad industrial o intelectual (contratos, licencias, acuerdos, etc.) en los que haya colaborado. Indique: a) el orden de firma de autores; b) referencia; c) título; d) países prioritarios; e) fecha; f) entidad y empresas que explotan la patente o información similar, en su caso.*





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### Parte A. DATOS PERSONALES

Nombre	ANTONIO		
Apellidos	MARTÍNEZ FÉREZ		
Sexo (*)		Fecha de nacimiento (dd/mm/yyyy)	
DNI, NIE, pasaporte			
Dirección email	amferez@ugr.es	URL Web	https://www.ugr.es/~amferez
Open Researcher and Contributor ID (ORCID) (*)	0000-0001-5750-7900		

\* datos obligatorios

### A.1. Situación profesional actual

Puesto	CATEDRÁTICO DE UNIVERSIDAD Responsable de Grupo de Investigación TEP025		
Fecha inicio	03/11/2018		
Organismo/ Institución	UNIVERSIDAD DE GRANADA		
Departamento/ Centro	INGENIERÍA QUÍMICA / FACULTAD DE CIENCIAS		
País	ESPAÑA	Teléfono	958241581
Palabras clave	Tecnología de membranas e intercambio iónico, Escalado industrial, Tecnologías de micro y nanoencapsulación		

### A.2. Situación profesional anterior (incluye interrupciones en la carrera investigadora, de acuerdo con el Art. 14. 2.b) de la convocatoria, indicar meses totales)

Periodo	Puesto/ Institución/ País / Motivo interrupción
2010-2018	PROFESOR TITULAR DE UNIVERSIDAD
2010	PROFESOR CONTRATADO DOCTOR
2006-2010	PROFESOR AYUDANTE DOCTOR
2005-2006	PROFESOR ASOCIADO

(Incorporar todas las filas que sean necesarias)

### A.3. Formación Académica

Grado/Master/Tesis	Universidad/País	Año
Ingeniero Técnico Industrial, espec. Química Industrial	Jaén/España	2007
Doctor en Ingeniería Química	Granada/España	2004
Máster en Tecnología y Calidad de los Alimentos	Granada/España	2001
Ingeniero Químico	Granada/España	1999

(Incorporar todas las filas que sean necesarias)

### Parte B. RESUMEN DEL CV (máx. 5000 caracteres, incluyendo espacios)

Catedrático de Ingeniería Química desde 2018. Profesor Titular de Universidad de 2010 a 2018. Profesor Asociado, Ayudante Doctor y Contratado Doctor de 2005 a 2010. Doctor en Ingeniería Química por la Universidad de Granada desde 2004. Responsable del Grupo de Investigación PAIDI TEP025 Tecnología de Procesos Químicos y Bioquímicos desde 2011. Investigador Principal e IP Tutor de varios proyectos con financiación pública, entre ellos

Firma (1): MARÍA CARMEN RODRÍGUEZ ROMERO  
En calidad de: Solicitante



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Pág. 28 de 41

CTQ2010-21411 y CTM2014-61105. Investigador en 14 Proyectos de I+D con financiación pública. Investigador Principal de >20 Contratos de I+D con financiación privada (algunas de las empresas son Fresenius Kabi GmbH, Labialfarma SA, Solutex GC SL, Laboratorios Amifar SL, etc). 113 publicaciones JCR en base de datos Scopus. >50 publicaciones en el primer cuartil (Q1). Número total de citas (Scopus): 4697. Índice h = 30. 2 libros y >10 capítulos de libro publicados. 6 Tesis Doctorales dirigidas en los últimos 10 años. 10 Trabajos Fin de Máster dirigidos en los últimos 10 años. >140 contribuciones a congresos nacionales e internacionales. Ganador del 1º Premio Ciencias de la Salud (2005). Socio fundador de spin-off de la Universidad de Granada: Bioprocesa Technologies SL. 6 estancias internacionales: Universidad Justus Liebig de Giessen (Alemania) como doctorando, en Universidad de Maastricht (Holanda), Universidad Iberoamericana (México) y Universidad Autónoma Metropolitana como Postdoc, en Zylö Therapeutics (EEUU) y Universidad de California San Diego como investigador visitante. Co-inventor de 4 patentes internacionales (WO2005/067962, WO2017/056075, PCT/ES2018/070292 y PCT/ES2020/070729) y 1 patente nacional (P202200042). 4 sexenios: 3 de investigación (2005-2010, 2011-2016 y 2017-2023) y 1 de transferencia (2013-2018). Mención “Top Downloaded Article 2021” por la Editorial John Wiley & Sons, Inc.

### Parte C. LISTADO DE APORTACIONES MÁS RELEVANTES (últimos 10 años)

#### C.1. Publicaciones más importantes en revistas con “peer review”.

1. Live Lozada, G.S., García López, A.I., Martínez-Férez, A., Ochando-Pulido, J.M. (3/4). **2022**. On the modeling and optimization of two-phase olive-oil washing wastewater treatment and polyphenols recovery by ceramic tubular microfiltration membranes. *Journal of Environmental Management*, 316, 115227.

Citas: 4. Promedio citas: 4/año. DOI: 10.1016/j.jenvman.2022.115227

2. Vellido-Perez, J.A., Ochando-Pulido, J.M., Brito-de la Fuente, E., Martinez-Ferez, A. (4/4). **2021**. Novel emulsions-based technological approaches for the protection of omega-3 polyunsaturated fatty acids against oxidation processes – A comprehensive review. *Food Structure* 27, 100175.

Citas: 5. Promedio citas: 5/año. DOI: 10.1016/j.foostr.2021.100175

3. Ochando-Pulido, J.M., Vellido-Pérez, J.A., González-Hernández, R., Martinez-Ferez, A. (4/4). **2020**. Optimization and modeling of two-phase olive-oil washing wastewater integral treatment and phenolic compounds recovery by novel weak-base ion exchange resins. *Separation and Purification Technology* 249, 117084.

Citas: 14. Promedio citas: 7/año. DOI: 10.1016/j.seppur.2020.117084

4. Pimentel-Moral, S., Borrás-Linares, I., Lozano-Sánchez, J., ..., Martinez-Ferez, A., Segura-Carretero, A. (5/6). **2019**. Supercritical CO2 extraction of bioactive compounds from Hibiscus sabdariffa. *Journal of Supercritical Fluids* 147, 213–221.

Citas: 40. Promedio citas: 17/año. DOI: 10.1016/j.supflu.2018.11.005

5. González, E. Gómez-Caravaca, A.M. ..., Martinez-Ferez, A. Segura-Carretero, A. Rober P. (6/8). **2019**. Evolution of the phenolic compounds profile of olive leaf extract encapsulated by spray-drying during in vitro gastrointestinal digestion. *Food Chemistry* 279, 40-48.

Citas: 47. Promedio citas: 15/año. DOI: 10.1016/j.foodchem.2018.11.127

6. Pimentel-Moral, S., Teixeira, TC, ..., Martinez-Ferez, A. Segura-Carretero, A. Souto, E.B. (5/7). **2018**. Lipid nanocarriers for the loading of polyphenols—A comprehensive review. *Advances in colloid and interface science*. 260, 85-94.

Citas: 63. Promedio citas: 15. DOI: 10.1016/j.cis.2018.08.007



## C.2. Congresos.

1. Autores: Vellido-Pérez J.A., Brito-de la Fuente E., Martínez-Férez A.  
 Título: A new strategy for Omega-3 PUFAs protection and curcumin vectorization via water-in-oil gelled-in-water multiple emulsion  
 Tipo de participación: Póster  
 Congreso: ACS FALL 2023 - Harnessing the Power of Data  
 Lugar de celebración: San Francisco – Fecha: 13-17 Agosto **2023**
2. Autores: Ochando-Pulido, J.M., Stoller, M., Martínez-Férez, A.  
 Título: About sub-boundary operating conditions as efficient process control tool during purification of agro-industrial effluents.  
 Tipo de participación: Póster  
 Congreso: Euromembrane Conference  
 Lugar celebración: Valencia - Fecha: 9-13 Julio **2018**
3. Autores: Ochando-Pulido, J.M., Corpas, J.R., Verardo, V., Martinez-Ferez, A.  
 Título: Recovery of phenolic compounds from olive oil mill wastewaters by a membrane separation approach  
 Tipo de participación: Póster  
 Congreso: Foodinnova 2017  
 Lugar celebración: Cesena, Italia - Fecha: 31 Enero-3 Febrero **2017**
4. Autores: Lopez-Romero, J.M., Baeyens, J.M., Prados, J.C., Melguizo, C., Leiva M.C., Martinez-Ferez, A., Casado M.A., Contreras-Caceres R., Diaz A.  
 Título: Nanoparticles for drug delivery: from camptothecin to paclitaxel.  
 Tipo de participación: Póster  
 Congreso: 5th Intern. Conference on Pharmaceutics & Novel Drug Delivery Systems  
 Lugar celebración: Dubai (Emiratos Árabes) - Fecha: 16-18 Marzo **2015**.

## C.3. Proyectos o líneas de investigación en los que ha participado.

1. Proyecto: Optimización de técnicas para el desarrollo de emulsiones dobles estabilizadas con polímeros naturales y sintéticos: aplicación potencial y funcionalidad (Ref. A/016463/08).  
 Financiación: Ministerio de Asuntos Exteriores y Cooperación.  
 Investigador Principal.
2. Proyecto: Depuración de aguas residuales de la industria oleícola para su reutilización en el proceso (Ref. CTQ2010-21411).  
 Financiación: Ministerio de Ciencia e Innovación.  
 Investigador Principal.
3. Proyecto: Nanopartículas de Paclitaxel: eficacia antitumoral, toxicidad e influencia del bloqueo de receptores Sigma-1 (Ref. P11-CTS-7649).  
 Financiación: Junta Andalucía. Consejería de Economía y Conocimiento.  
 Investigador Colaborador.
4. Proyecto: Molecular reclassification to find clinically useful biomarkers for systemic autoimmune diseases mechanisms for the improvement of drug development and therapy (Preciseads) (Ref. Grant agreement 115565).  
 Financiación: European Commission – FP7/2007-2013.  
 Investigador Colaborador.



5. Proyecto: Diseño y desarrollo de un proceso integral de revalorización y tratamiento de las aguas residuales de la industria oleícola (Ref. CTM2014-61105).

Financiación: Ministerio de Economía y Competitividad.

Investigador Tutor.

#### **C.4. Participación en actividades de transferencia de tecnología/conocimiento y explotación de resultados.**

PATENTE WO2005/067962

Inventores: **Antonio Martínez Férez**, Luis Baró Rodríguez, Julio Boza Puerta, Juristo Fonollá Joya, Emilia Guadix Escobar, Jesús Jiménez López, Eduardo López-Huertas León, Jordi Xaus Pei.

Título: Composition comprising growth factors and oligosaccharides.

Países prioritarios: Internacional - Tratado de Cooperación de Patentes (PCT)

Solicitante y/o empresas que la explotan: Puleva Biotech SA

PATENTE WO2017/056075

Inventores: **Antonio Martínez Férez**, Fernando Moreno Egea.

Título: Process for the preparation and stabilization of emulsions with omega-3 by means of isometric crystalline networks of cellulose derivatives.

Países prioritarios: Internacional - Tratado de Cooperación de Patentes (PCT)

Solicitante y/o empresas que la explotan: Solutex GC, S.L.

PATENTE PCT/ES2018/070292

Inventores: **Antonio Martínez Férez**, Javier M. Ochando Pulido.

Título: Procedimiento para el tratamiento de residuos y obtención de subproductos de almazaras.

Países prioritarios: España

Solicitante y/o empresas que la explotan: Universidad de Granada

PATENTE PCT/ES2020/070729

Inventores: **A. Martínez-Ferez**, J.M. Ochando-Pulido, G. Vilardi, M. Stoller, L. di Palma, N. Verdone.

Título: Procedimiento de preparación de nanopartículas metálicas con alta capacidad reductora.

Países prioritarios: España e Italia.

Solicitante y/o empresas que la explotan: Universidad de Granada (50%) y Universidad de Roma (50%).

PATENTE ES202200042

Inventores: **A. Martínez-Ferez**, J. Perales Adán, J.C. Fuentes Marín.

Título: Nuevo complejo biomimético antioxidante para la protección integral frente a la radiación solar. Método de obtención y estabilización.

Países prioritarios: España.

Solicitante y/o empresas que la explotan: Laboratorios Amifar SL.





## CURRICULUM VITAE (CVA)

**IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.**

### Part A. PERSONAL INFORMATION

CV date 25/01/2023

First name	Manuel		
Family name	Cuevas Aranda		
Gender (*)		Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail	mcuevas@ujaen.es		URL Web
Open Researcher and Contributor ID (ORCID) (*)	0000-0003-4160-2174		

(\*) Mandatory

### A.1. Current position

Position	Associate Professor		
Initial date	2019		
Institution	University of Jaén		
Department/Center	Chemical, Environmental and Materials Engineering	Higher Polytechnic School of Linares	
Country	Spain	Teleph. number	+34 953648572
Keywords	Biomass, Bioenergy, Pyrolysis, Torrefaction, Gasification, Olive oil industries		

### A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD	University of Jaén (Spain)	2007
Degree in Industrial Engineering	University of Castilla-La Mancha (Spain)	2006
B.Sc. in Chemical Engineering	University of Granada (Spain)	1999

### Part B. CV SUMMARY (max. 5000 characters, including spaces)

Bachelor in Chemical Engineering at the University of Granada (1999), Bachelor in Industrial Engineering at the University of Castilla-La Mancha (2006), and PhD for the University of Jaén (2007).

I worked, for a year, in the production department of the paper-making company "Torras-papel S.A." (factory of Motril, Granada).

Teaching profile: teacher, since 2001, in Degree courses in the training curricula of the Higher Polytechnic School of Linares (University of Jaén). Currently, I am Associate Professor in Chemical Engineering at the University of Jaén (since 2019), and my academic activity covers teaching to undergraduate, master and doctorate students in engineering and science programs, focusing on the field of fuel engineering and industrial chemical processes. I got recognized 4 six-years teaching periods and I have been coordinator in two Teaching Innovation Projects. I have published several scientific papers and one book on the use of chemical process simulators in university teaching.





Research profile: my research activity, at the University of Jaén, started when I joined the research group “Bioprocesses” (TEP-138) to carry out the Doctoral Thesis on biochemical conversion of lignocellulosic biomasses for ethanol production (2007). My research activity focuses on agricultural wastes valorization (olive stones, pruning from olive and almond trees, olive pomaces, exhausted olive pomaces, etc.) by hydrothermal (wet torrefaction) and acid treatments, pyrolysis, torrefaction and gasification. Additionally, my research interests are in biorefinery processes and bio-adsorption of organic compounds.

Some examples of recent papers on thermochemical treatments of lignocellulosic biomass are:

Wet torrefaction:

- Effect of short-time hydrothermal carbonization on the properties of hydrochars prepared from olive-fruit endocarps. *Energy and Fuels* (2019) 33, 313-322.
- Upgrading almond-tree pruning as a biofuel via wet torrefaction. *Renewable Energy* (2020) 145, 2019-2100.

Pyrolysis:

- Thermal characterization and pyrolysis kinetics of six types of tropical timber from Central Africa. *Fuel* (2022) 307, 121824.

I have been supervisor of one completed Doctoral Thesis and more than 50 completed Master Thesis and Degrees Final Projects. I am currently supervising a Doctoral Thesis on biomass gasification,

I have participated in 9 research projects, in addition to 5 research contracts with different companies. This research work has led to 26 JCR publications, which have received 513 citations (h = 14, Scopus). I have 3 active six-year research periods (CNEAI). Currently, I participate in three European Projects that try to improve the economic and environmental viability of the olive grove in the Mediterranean countries.

I visited the Biotechnology Center of the University of Concepción (Chile), as a visiting post-doctoral researcher, during the summers of 2008 and 2009.

Academic positions: secretary of the Department of Chemical, Environmental and Materials (University of Jaén, 2017).

## Part C. RELEVANT MERITS (sorted by typology)

### C.1. Publications (in the last ten years)

**Scientific paper 1.** M<sup>a</sup> Lourdes Martínez Cartas; Sebastián Sánchez; **Manuel Cuevas**. 2022. Thermal characterization and pyrolysis kinetics of six types of tropical timbers from Central Africa. *Fuel*. Elsevier. 307, pp.1-10.

**Scientific paper 2.** **Manuel Cuevas**; Juan F. García Martín; Vicente Bravo; Sebastián Sánchez. 2021. Ethanol production from olive stones through liquid hot water pre-treatment, enzymatic hydrolysis and fermentation. Influence of enzyme loading, and pretreatment temperature and time. *Fermentation*. MDPI. 7-25, pp.1-17.

**Scientific paper 3.** Soledad Mateo; Alberto J. Moya; Gassan Hodaifa; Sebastián Sánchez; **Manuel Cuevas**. 2021. Valorization of olive endocarp from olive oil and table olive processing as a low-cost bioadsorbent for the removal of furfural from aqueous solutions. *Journal of Water Process Engineering*. Elsevier. 44, pp.1-10.

**Scientific paper 4.** **Manuel Cuevas**; Marwa Saleh; Juan Francisco García-Martín; Sebastián Sánchez. 2020. Acid and enzymatic fractionation of olive stones for ethanol production using *Pachysolen tannophilus*. *Processes*. MDPI. 8-195, pp.1-14.

**Scientific paper 5.** Juan Francisco García Martín; **Manuel Cuevas**; Chao-Hui Feng; Paloma Álvarez Mateos; Miguel Torres García; Sebastián Sánchez. 2020. Energetic valorization of



olive biomass: Olive-tree pruning, olive stones and pomaces. Processes. MDPI. 8-511, pp.1-37.

**Scientific paper 6.** Roque Aguado; **Manuel Cuevas**; Luis Pérez-Villarejo; M<sup>a</sup> Lourdes Martínez-Cartas; Sebastián Sánchez. 2020. Upgrading almond-tree pruning as a biofuel via wet torrefaction. Renewable Energy. Elsevier. 145, pp.2091-2100.

**Scientific paper 7.** **Cuevas-Aranda, Manuel**; Martínez-Cartas, M<sup>a</sup> Lourdes; Pérez-Villarejo, Luis; Hernández, Lucía; García-Martín, Juan Francisco; Sánchez-Villasclaras, Sebastián. 2019. Drying kinetics and effective water diffusivities in olive stone and olive-tree pruning. Renewable Energy. Elsevier. 132, pp.911-920.

**Scientific paper 8.** Sebastián Sánchez; Rafael Pacheco; Alberto J. Moya; **Manuel Cuevas**. 2019. Separación de fases sólidas y líquidas. Evolución en los últimos 25 años. Mercacei Magazine. Edimarket Editores. julio/octubre-100, pp.104-108.

**Scientific paper 9.** Mateo-Quero, M<sup>a</sup> Soledad; **Cuevas-Aranda, Manuel**; Rubia-García, M<sup>a</sup> Dolores La; Eliche-Quesada, Dolores. 2017. Preliminary study of the use of spent diatomaceous earth from the brewing industry in clay matrix bricks. Advances in applied ceramics. pp.1-9.

**Scientific paper 10.** **Cuevas-Aranda, Manuel**; Sánchez-Villasclaras, Sebastián; García-Martín, Juan Francisco; Baeza, Jaime; Parra, Carolina; Freer, Juanita. 2015. Enhanced ethanol production by simultaneous saccharification and fermentation of pretreated olive stones. Renewable Energy. 74, pp.839-847.

**Scientific paper 11.** **Cuevas-Aranda, Manuel**; Saleh, Marwa; García-Martín, Juan Francisco; Sánchez-Villasclaras, Sebastián. 2015. Influence of solid loading on D-xylose production through dilute sulphuric acid hydrolysis of olive stones Grasas y Aceites (Sevilla). 66-3, pp.1-10.

**Scientific paper 12.** **Cuevas-Aranda, Manuel**; García-Martín, Juan Francisco; Hodaifa-Meri, Gassan; Sánchez-Villasclaras, Sebastián. 2015. Oligosaccharides and sugars production from olive stones by autohydrolysis and enzymatic hydrolysis Industrial Crops and Products. 70, pp.100-106.

**Scientific paper 13.** **Cuevas-Aranda, Manuel**; García-Martín, Juan Francisco; Sánchez-Villasclaras, Sebastián. 2014. Enhanced enzymatic hydrolysis of pretreated almond-tree prunings for sugar production Carbohydrate Polymers. 99, pp.791-799.

**Scientific paper 14.** **Cuevas-Aranda, Manuel**; Mateo-Quero, M<sup>a</sup> Soledad; Hodaifa-Meri, Gassan; Moya-López, Alberto J.; Sánchez-Villasclaras, Sebastián. 2014. Furfural removal from liquid effluents by adsorption onto commercial activated carbon in a batch heterogeneous reactor Ecological Engineering. 68, pp.241-250.

**Scientific paper 15.** **Cuevas-Aranda, Manuel**; Fernández-Valdivia, Diego Ginés; Parra-ruiz, María Luisa; Navarro -nieto, Sofía. 2014. Use of computer simulations for improving teaching in the Chemical Engineering laboratory. Modelling in Science Education and Learning. 7, pp.93-102.

**Scientific paper 16.** Saleh, Marwa; **Cuevas-Aranda, Manuel**; García-Martín, Juan Francisco; Sánchez-Villasclaras, Sebastián. 2014. Valorization of olive stones for xylitol and ethanol production from dilute acid pretreatment via enzymatic hydrolysis and fermentation by *Pachysolen tannophilus*. Biochemical Engineering Journal. 90, pp.286-293.

**Scientific paper 17.** Juan F. García Martín; Sebastián Sánchez Villasclaras; **Manuel Cuevas Aranda**. 2013. Evaluation of the effect of the dilute acid hydrolysis on sugars release from olive prunings. Renewable Energy. 51, pp.382-387.

**Scientific paper 18.** García-Martín, Juan Francisco; Sánchez-Villasclaras, Sebastián; **Cuevas-Aranda, Manuel**. 2013. Evaluation of the effect of the dilute acid hydrolysis on sugars release from olive prunings. Renewable Energy. 51, pp.382-387.

**Scientific paper 19.** **Cuevas-Aranda, Manuel**; García-Martín, Juan Francisco; Cruz-Pérez, Nicolás; Sánchez-Villasclaras, Sebastián. 2013. Generación de D-xilosa por tratamiento hidrotérmico de endocarpios de aceitunas e hidrólisis enzimática de los oligosacáridos. Afinidad: Revista de Química Teórica y Aplicada. 70-562, pp.99-106.

**Book chapter 1.** **Cuevas-Aranda, Manuel**; Sánchez-Villasclaras, Sebastián; García-Martín, Juan Francisco. 2015. Thermochemical and biochemical conversion of olive stones. In: Agricultural wastes: Characteristics, types and management. pp.61-85. Nova Science Publishers.



## C.2. Congress (in the last ten years)

1. Danay Legarreta; Lázaro Garrido.; Manuel Cuevas; Sebastián Sánchez. Dry torrefaction of olive endocarp for biochar production. 30th European Biomass Conference and Exhibition Proceedings, 2022, pp. 761–764.
2. Lázaro Garrido Moreno; Manuel Cuevas Aranda; Sebastián Sánchez Villasclaras. Effect of air flow on the performance of a downdraft gasifier fed with olive stones. 28th European Biomass Conference and Exhibition Proceedings, 2020, pp. 460–463.
3. Garrido L., Sánchez S., Cuevas M. (2019). Olive-fruit endocarp characterization for gasification. 3<sup>rd</sup> International Congress of Chemical Engineering (Santander, España).
4. Alberto J. Moya López; Manuel Cuevas Aranda; M<sup>a</sup> Soledad Mateo Quero; Gassan Hodaifa Meril; Sebastián Sánchez Villasclaras. Poda de olivo como material adsorbente para la eliminación de hierro de medios acuosos. XVIII Simposium Científico Técnico EXPOLIVA. 2017.
5. Sebastián Sánchez Villasclaras; Manuel Cuevas Aranda; Juan Francisco García Martín. Bioethanol production: Corn vs lignocellulose biomass from olive oil industry & potential impacts on food security. International Congress and Expo on Biofuels & Bioenergy. 2015.

## C.3. Research projects (in the last ten years)

**Research Project 1.** Proyecto ARTOLIO. Unión Europea. (Universidad de Jaén). From 01/09/2020. 2.900.000 €. Researcher.

**Research Project 2.** Tratamiento de aguas residuales, eliminación de dióxido de carbono de efluentes gaseosos de la industria oleícola, producción de microalgas a nivel de miniplanta y obtención de biocombustibles. Programa Operativo FEDER Andalucía 2014-2020. From 01/01/2021. Researcher.

**Research Project 3.** New generation of biocomposites based on olive fibers for industrial applications. Life 18. Comisión Europea. (Universidad de Jaén). From 01/07/2019. 143.480,7 €. Researcher.

**Research Project 4.** Novel approaches to promote the sustainability of olive groves in the Mediterranean (SUSTAINOLIVE project). From 25/01/2019. 2.100.000 €. Researcher.

**Research Project 5.** Estudio de procesos de deslignificación del residuo de poda de olivo. Aplicación a su aprovechamiento bioquímico. Diputación Provincial de Jaén. Instituto de Estudios Giennenses. From 10/11/2015. 8.000 €. Researcher.

**Research Project 6.** AGR-6131, Modelado y control de secadero rotativo de orujo. Junta de Andalucía. From 09/02/2011. 159.807,61 €. Researcher.

**Research Project 7.** AGR-6509, Producción de biocombustibles utilizando hueso de aceituna y residuos de poda de olivo. Junta de Andalucía. From 09/02/2011. 179.978,6 €. Researcher.

## C.4. Contracts, technological or transfer merits (in the last ten years)

**Contract 1.** "Investigación y desarrollo del proyecto sobre valorización de hoja de olivo como ingrediente nutricional en alimentación". Company: Oleoestepa S.C.A. 01/01/2013-30/09/2014. IP: Sebastián Sánchez Villasclaras. 37.500 €.

**Contract 2.** "Caracterización funcional de la hoja de olivo para su posible valorización en diferentes usos industriales". Company: Agrícola "El rubio" S.C.A. 23/04/2018-23/11/2018. 1.666,67 €.





Parte A. DATOS PERSONALES		Fecha del CVA	06/11/2023
Nombre y apellidos	María José Ibáñez González		
Núm. identificación del investigador	Researcher ID	A-3085-2015	
	Código Orcid	0000-0002-4793-8333	
	SCOPUS Author ID (*)	7801542139	
	WoS Researcher ID (*)	A-3085-2015	

**A.1. Situación profesional actual**

Organismo	Universidad de Almería		
Dpto./Centro	Escuela Superior de Ingeniería		
Dirección	Crta Sacramento S/N		
Teléfono	950015960	Correo electrónico	mjibanez@ual.es
Categoría profesional	Profesora Titular de Universidad	Fecha inicio	13/01/2004
Espec. cód. UNESCO	33 y 3328		
Palabras clave	Microalgas, biodiesel, purificación biomoléculas, concentración de cultivo, reactor flujo de vórtices		

**A.2. Formación académica (título, institución, fecha)**

Licenciatura/Grado/Doctorado	Universidad	Año
Licenciada en Ciencias Químicas	Universidad de Granada	1993
Doctorado en Ciencias Químicas	Universidad de Almería	1998

**A.3. Indicadores generales de calidad de la producción científica (véanse instrucciones)**

Número de sexenios de investigación concedidos: 4. En los periodos los periodos 1995-2000, 2001-2006, 2007-2014 y 2015-2020.

**Parte B. RESUMEN LIBRE DEL CURRÍCULUM (máximo 3500 caracteres, incluyendo espacios en blanco)**

**Licenciada en Ciencias Químicas** por la Universidad de Granada (1993)

**Becaria de Investigación** programa de intercambio de personal investigador entre industrias y centros públicos de investigación, modalidad D. 1 Noviembre, 1994 - 30 Septiembre, 1996. Ministerio de Educación y Cultura. En la Empresa Deretil en Villaricos (Almería)

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 En calidad de: Solicitante





**Becaria del Programa Intercampus** del Instituto de Cooperación Iberoamericana. 14 Agosto - 29 Septiembre, 1995. Ministerio de Asuntos Exteriores. En la Universidad Nacional de la Patagonia San Juan Bosco, La Patagonia (Argentina).

**Becaria Predoctoral** de Formación de personal docente e investigador diciembre 1996. Consejería de Educación y Ciencia de la Junta de Andalucía. En la Universidad de Almería

**Becaria Predoctoral** de formación de profesorado universitario. 1 Enero, 1997 - 31 Diciembre, 1998. Ministerio de Educación y Ciencia. En la Universidad de Almería

**Doctora en Ciencias Químicas** por la Universidad de Almería (1998). Título de la tesis: Obtención de ácido eicosapentaenoico (20:5n3) a partir de la microalga marina *Phaeodactylum tricornutum*

**Premio extraordinario de doctorado** de la Facultad de Ciencias Experimentales correspondiente al curso académico 1998/1999. Universidad de Almería.

**Becaría Posdoctoral** del Subprograma de perfeccionamiento para doctores y tecnólogos en el extranjero. 1 Septiembre, 1999 hasta 16 de Octubre 2000 y Febrero de 2001. Ministerio de Educación y Ciencia. En el MIT con el Profesor Charles L. Cooney.

**Profesora Titular de Universidad.** Desde Enero del 2004 hasta la fecha. En la Universidad de Almería en el Departamento de Ingeniería Química

**Investigadora principal** del proyecto CTQ2006-05788. Caracterización de un reactor pulsante de flujo de vórtice para simplificar los procesos de purificación de proteínas. 01/10/2006- 30/03/2010. 121000 euros.

**Directora del departamento de Ingeniería Química** de la Universidad de Almería. Desde Diciembre de 2018 hasta la fecha.

**Investigadora principal** del proyecto UAL18-BIO-A016-B1. Tecnologías limpias y competitivas aplicadas a la obtención y purificación de biomoléculas. 01/10/2019 to 31/03/2021. 6500 euros.

**Investigadora** en el proyecto BIO-guided optimization of bioprocesses based on microalgae with applications in the agri-food industry (PID2019-109476RB-C22) 01/01/2020-31/12/2023

Mi investigación está centrada en la actualidad en el escalamiento del desamargado del zumo de naranja de la Industria agroalimentaria usando cromatografía en lecho expandido en el reactor flujo de vórtices. Y de forma general en la purificación de biomoléculas usando el mismo tipo de reactor que ha sido patentado a partir de mi estancia postdoctoral en el MIT. También participo en la deshidratación de cultivos mediante osmosis directa.

He coordinado dos proyectos y participado en siete proyectos de investigación. También he participado en siete patentes y he publicado 20 artículos en revistas internacionales y 1 capítulo de libro. He dirigido una tesis doctoral y participo en las networks: International society for applied phycology (ISAP) y European Algae Biomass Association (EABA)

Evaluadora externa de la Agencia Andaluza del Conocimiento de Proyectos de Innovación Educativa de las Universidad Públicas Andaluzas en las convocatorias 2013 (3 proyectos), 2014 (1 proyecto), 2016 (3 proyectos), 2017 (2 proyectos), 2019 (3 proyectos), 2022 (2 proyectos) y 2023 (4 proyectos).

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En calidad de: Solicitante





## Parte C. MÉRITOS MÁS RELEVANTES (ordenados por tipología)

### C.1. Publicaciones

Salma Karamad Yazdanabad, Yolanda Soriano Jerez, Abdolreza Samimi, Soheila Shokrollahzadeh, Davod Mohebbi-Kalhari, **María José Ibáñez González**, Tania Mazzuca Sobczuk and Emilio Molina Grima. 2023. Microalgal biofouling formation on tubular cellulose-ester membranes during dewatering by forward osmosis. *Biofouling*. 29: 1-14. (Q1)  
DOI 10.1080/08927014.2023.2218282

Redondo-Miranda, Rosa M; **Ibáñez-González, María J.**; Mazzuca-Sobczuk, Tania; Molina-Grima, Emilio. Vortex flow reactor assessment for purification of extracellular molecules from unclarified broth. 2021. *Chromatography A*. 1655: 1-12. (Q1).  
DOI <https://doi.org/10.1016/j.chroma.2021.462502>

Karamad Yazdanabad, Salma, Samimi, Abdolreza; Shokrollahzadeh Soheila, Mohebbi Kalhari Davood, Moazami Nasrin, **Ibáñez González, María José**, Mazzuca Sobczuk, Tania and Molina Grima, Emilio. 2021. Microalgae biomass dewatering by forward osmosis: review and critical challenges. *Algal research*. 56: 1-17 (T1).  
DOI: <https://doi.org/10.1016/j.algal.2021.102323>

Aslani, A., Mohammadi, M., **Ibáñez Gonzalez, Maria J.**, Mazzuca Sobczuk, T., Nazari, M., Bakhtiar, A. 2018., *Bioresource Technology Reports*, 1, 24-30. SCImago Journal Rank (SJR): 0.758, h-index 9 (Q2). <https://doi.org/10.1016/j.biteb.2017.12.001>

- **Ibáñez-Gonzalez, Maria Jose**; Redondo-Miranda, Rosa María; Mazzuca-Sobczuk, Tania, Molina-Grima, Emilio and Charles. L Cooney. 2016. A novel vortex flow reactor for purification of B-phycoerythrin from *Porphyridium cruentum*. *Chemical Engineering Research and Design*. 111: 24-33 (T1). DOI: 10.1016/j.cherd.2016.03.032

Mazzuca-Sobczuk, Tania; **Ibáñez-Gonzalez, Maria Jose**; Molina-Grima, Emilio; Chisti, Yusuf. 2015. Forward osmosis with waste glycerol for concentrating microalgae slurries. *Algal Research*. 8:168-173. (Q1)

Gonzalez-Ramirez, E., Andujar-Sanchez, M., Ortiz-Salmeron, E., Bacarizo, J., Cuadri, C., Mazzuca-Sobczuk, T., **Ibáñez González, M.J.**, et al. (2014). Thermal and pH stability of the B-phycoerythrin from the red algae *porphyridium cruentum*. *Food Biophysics*, 9(2), 184-192. (Q1)

Camara-Artigas, A., Bacarizo, J., Andujar-Sanchez, M., Ortiz-Salmeron, E., Mesa-Valle, C., Cuadri, C., **Ibáñez González, MJ** et al. (2012). pH-dependent structural conformations of B-phycoerythrin from *porphyridium cruentum*. *Febs Journal*, 279(19), 3680-3691. (T1)

**Ibáñez-Gonzalez, Maria Jose**; Cooney-,Charles (2007). Studies on protein adsorption in a vortex flow reactor. *Process biochemistry*, 42(12), 1592-1601. (P1)  
DOI: 10.1016/j.procbio.2007.08.012

Acien-Fernandez, Francisco Gabriel; Brindley-Alias, Celeste Elena; Sanchez-Perez, Jose Antonio; Fernández-Sevilla, José María; **Ibáñez-Gonzalez, Maria Jose**; Molina-Grima, Emilio (2003) Production of 13c polyunsaturated fatty acids from the microalga *phaeodactylum tricornutum*, *Journal of Applied Phycology*. 15, 229-237.(Q3)





Universidad de Granada	
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Bermejo-Román, Ruperto; Acien-Fernandez, Francisco Gabriel; **Ibañez-Gonzalez, Maria Jose**; Fernández-Sevilla, José María; Molina-Grima, Emilio; Alvarez-Pez, Jose María (2003) Preparative purification of b-phycoerythrin from the microalga *Porphyridium cruentum* by expanded-bed adsorption chromatography. Journal of chromatography. B, 790 (1-2), 317-325. (Q2)

Acien-Fernandez, Francisco Gabriel; Brindley-Alias, Celeste Elena; Garcia-Malea-Lopez, Maria Del Carmen; Fernández-Sevilla, José María; **Ibañez-Gonzalez, Maria Jose**; Núñez-Gómez, Rafael; Molina-Grima, Emilio (2003). Assessment of the production of c-13 labeled compounds from phototrophic microalgae at laboratory scale. Biomolecular engineering, 20 (4-6), 149-162. (Q2)

**Ibañez-Gonzalez, Maria Jose**; Robles-Medina, Alfonso; Esteban-Cerdán, Luis; Camacho-Páez, Belén; Gimenez-Gimenez, Antonio; Molina-Grima, Emilio. (2001) Adsorption equilibria of fatty acids between methanol/water and reversed-phase chromatographic adsorbents. Journal of the American Oil Chemists' Society, 78 (3) 277-284. (Q1)

Robles-Medina, Alfonso; Esteban-Cerdán, Luis; Gimenez-Gimenez, Antonio; Camacho-Páez, Belén; **Ibañez-Gonzalez, Maria Jose**; Molina-Grima, Emilio (1999) Lipase-catalyzed esterification of glycerol and polyunsaturated fatty acids from fish and microalgae oils. Journal of biotechnology, 70 (1-3), 379-391.(Q2)

Gimenez-Gimenez, Antonio; **Ibañez-Gonzalez, Maria Jose**; Robles-Medina, Alfonso; Molina-Grima, Emilio; Esteban-Cerdán, Luis. (1998) Downstream processing and purification of eicosapentaenoic (20:5n-3) and arachidonic acids (20:4n-6) from the microalga porphyridium cruentum. Bioseparation, 7(2), 89-99. (Q3)

Robles-Medina, Alfonso; Molina-Grima, Emilio; Gimenez-Gimenez, Antonio; **Ibañez-Gonzalez, Maria Jose** (1998). Downstream processing of algal polyunsaturated fatty acids. Biotechnology advances, 16(3), 517-580. (Q2)

Esteban-Cerdán, Luis; Robles-Medina, Alfonso; Gimenez-Gimenez, Antonio; **Ibañez-Gonzalez, Maria Jose**; Molina-Grima, Emilio (1998) Synthesis of polyunsaturated fatty acid-enriched triglycerides by lipase-catalyzed esterification. Journal of the American Oil Chemists' Society, 75(10), 1329-1337. (P1)

**Ibañez-Gonzalez, Maria Jose**; Robles-Medina, Alfonso; Molina-Grima, Emilio; Gimenez-Gimenez, Antonio; Cartens, Marisa; Esteban-Cerdán, Luis (1998) Optimization of fatty acid extraction from phaeodactylum tricornutum utex 640 biomass. Journal of the American Oil Chemists' Society. 75 (12), 1735-1740. (P1)

Cartens, Marisa, Molina-Grima, Emilio; Robles-Medina, Alfonso; Gimenez-Gimenez, Antonio; Ibañez-Gonzalez, Maria Jose (1996) Eicosapentaenoic acid (20:5n-3) from the marine microalga *Phaeodactylum tricornutum*. Journal of the American Oil Chemists' Society, 73 (8), 1025-1031. (1997, Q1 el primer año)

Molina-Grima, Emilio; Robles-Medina, Alfonso; Gimenez-Gimenez, Antonio; Ibañez-Gonzalez, Maria Jose (1996) GRAM-SCALE PURIFICATION OF EICOSAPENTAENOIC ACID (EPA, 20:5N-3) FROM WET PHAEODACTYLUM TRICORNUTUM UTEX 640 BIOMASS. Journal of applied Phycology, 8(4-5), 359-367, (1997, primer año Q3)

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En calidad de: Solicitante





### C.2. Proyectos

Optimización bio-guiada de bioprocesos basados en microalgas con aplicaciones en la industria agroalimentaria. Código: PID2019-109476RB-C22. Subvencionado por la Convocatoria 2019 PROYECTOS DE I+D+I - RTI TYPE: COORD, MINISTERIO DE CIENCIA E INNOVACIÓN; Principal: Asterio Sánchez Mirón and Francisco García Camacho. From: 01/01/2020-31/12/2023.

Tecnologías limpias y competitivas aplicadas a la obtención y purificación de biomoléculas. Código: UAL18-BIO-A016- B1. Subvencionado por fondos FEDER - ANDALUCÍA 2014-2020. **Principal: María José Ibáñez González** and Tania Mazzuca Sobczuk. From : 01/10/2019 to 31/03/2021. 6500 euros.

Potential use of neutral lipids from microalgae as raw material for biofuel production. Código: TEP-6797. Subvencionado por los PROYECTOS DE EXCELENCIA, JUNTA DE ANDALUCÍA. Responsable: Mazzuca-Sobczuk, Tania. From: 01/01/2011to 31/01/2015. (EUROS): 67590.

Enfoque en la producción y purificación de anticuerpos monoclonales. Código: P07-CVI-03193. PROYECTOS DE EXCELENCIA, JUNTA DE ANDALUCÍA. Molina-Grima, Emilio. Fecha inicio: 01/02/2008. Fecha fin: 31/01/2012. Cuantía total (EUROS): 166973

Caracterización de un reactor pulsante de flujo de vortice para simplificar los procesos de purificación de proteínas. Código: CTQ2006-05788. Programa financiador: PLAN NACIONAL I+D, MINISTERIO DE CIENCIA Y TECNOLOGÍA. **Responsable: Ibáñez-Gonzalez, María Jose**. Fecha inicio: 01/10/2006. Fecha fin: 30/03/2010. Cuantía total (EUROS): 121000

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Cultivo de microalgas en fotobiorreactores externos para la obtención de ácidos grasos poliinsaturados de cadena larga. Mejora genética de estirpes y purificación del producto. Código: BIO95-0692. Programa financiador: OTROS PROGRAMAS DEL PLAN NACIONAL I+D, MINISTERIO DE CIENCIA Y TECNOLOGÍA. Responsable: Molina-Grima, Emilio. Fecha inicio: 01/12/1995. Fecha fin: 30/11/1998. Cuantía total (EUROS): 149820.

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2019 - 2023. Transferencia del conocimiento. Participación en el día de la Niña y la Mujer en la Ciencia en Institutos de Secundaria de Almería. Delegación del Rector para la Igualdad, Universidad de Almería.

2017, 2018- Transferencia del conocimiento: tutora de prácticas de empresa.

2016, 2017, 2020-2021 - Transferencia del conocimiento: Participación en la Noche Europea de los Investigadores, Almería.

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### C.5 Tesis dirigidas

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