

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 (*)	Female	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 44 papers included in JCR, mainly in Q1 and Q2, 4 of them in D1, with a total of 780 citations; h-index: 17.; Co-author of 6 chapter of books; 58 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 (PIISA), 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) 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

ART2 (Q1) N. Methneni, J.A.Morales-González, A. Jaziri, H.B. Mansour, **M. Fernandez-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

ART3 (Q1) N. Methneni, J.A. González, J. Van Loco, R. Anthonissen, J.V. de Maele, L. Verschaeve, **M. Fernandez-Serrano**, H.B. Mansour (2021). Ecotoxicity profile of heavily contaminated surface water of two rivers in Tunisia. Environ. Toxicol. Pharmacol., 82, 103550



ART4 (Q1) N. Methneni, K. Ezdini, N.B. Abdeljelil, J.V.Loco, K.V. Houwe, R. Jabeur, O.F. Sallem, A. Jaziri, **M. Fernández-Serrano**, N.H. Khadry, H.B. Mansour (2021). Occurrence of Textile Dyes and Metals in Tunisian Textile Dyeing Effluent: Effects on Oxidative Stress Status and Histological Changes in Balb / c Mice. *Int. J. Mol. Sci.*, 22, 12568

ART5 (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.

ART6 (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

ART7 (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

ART8 (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

ART9 (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, 324-331

ART10 (Q1) M. Lechuga, **M. Fernandez-Serrano**, E. Jurado, J. Nunez-Olea, F. Rios (2016) Acute toxicity of anionic and non-ionic surfactants to aquatic organisms, *Ecotoxicology and Environmental Safety*, 125, 1-8

C.2. Congress

CONG1. 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. 3rd 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. 11th 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. 3rd 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 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.**

PROJ2: "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

PROJ3 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.**



PROJ4 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**.

PROJ5 - 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**.

PROJ6 “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**.

PROJ7 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**.

PROJ8 - 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: “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 €.

CONTRACT2: “Biodegradability tests” Company: SENSIENT COLORS UK LTD. Project leader: M. Lechuga Villena. Date: 01/09/2020 – 31/11/2020. 11.943,45 €.

CONTRACT3: “Biodegradability tests” Company: SENSIENT COLORS UK LTD. Project leader: M. Lechuga Villena. Date: 01/09/2020 – 31/11/2020. 17.116,41 €.

CONTRACT4. “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 €

CONTRACT5: REF: AEI-010600-2018-108 “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” 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 €.

CONTRACT6: “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 €.

CONTRACT7: “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.