



Part A. PERSONAL INFORMATION

CV date	04/10/2022
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First name	Eduardo		
Family name	Garcia-Verdugo Cepeda		
Gender	Male	Birth date	15/01/1971
ID number	18999710P		
e-mail	cepeda@uji.es	URL Web:	www.quimicasostenible.uji.es
Open Researcher and Contributor ID (ORCID)	0000-0001-6867-6240		

A.1. Current position

Position	Full Profesor (Catedrático)		
Initial date	10/2019		
Institution	University Jaume I		
Department/Center	Química Inorgánica y Orgánica	ESCTE	
Country	Spain	Teleph. number	964728751
Key words	Ionic Liquids, Polymers, Neoteric Solvents, Catalysis and Biocatalysis, Nanotechnology, Self-Assembly, Supercritical Fluids, Reactors, Molecular Receptors, Supramolecular Chemistry, Pseudopeptides, Amphiphiles, Flow Chemistry		

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

Period	Position/Institution/Country/Interruption cause
08/2010-10/2019	Titular de Universidad at Unirversity Jaume I
10/2009 to 08/2010	Científico Titular, CSIC, ICP, Madrid, (on temporary voluntary leave absence)
09/2004 to 08/2009	Ramon y Cajal Fellow at University of Jaume I Castellon.
10/2002 to 09/2004	Marie Curie Fellow at Nottingham, UK
04/2001 to 10/2002	Research Staff at Nottingham University, UK,
09/2000-09/2004	Profesor Asociado a tiempo parcial at University of Jaume I.

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Chemistry PhD	Univeristy Jaume I (Spain)	2001
Chemistry Degree	University Valencia (Spain)	1995

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

Based on my multidisciplinary background I always focus my research efforts working at the edge of the knowledge and in the borderline between Chemistry, Materials and Chemical Technology on the integration of new advanced interdisciplinary and intersectoral technologies to provide innovative solutions not achievable by conventional approaches. This is particularly important to develop new greener technologies (GT) in the context of a new circular economy where different technologies and stakeholders should be integrated to achieve new processes and products. In this regard, I have significant contribution to: 1) **Homogeneous and Immobilised catalysis** developing multistep catalytic processes integrating organo, chemometallic, metallic and bio-transformations for chemical synthesis and their combination with other enabling tools to achieved more efficient chemical process in terms of selectivity and stability. 2) **Continuous flow chemical** processes as enabling tools to develop synthesis of small molecules or materials, which is revolutionising the way to conduct and produce chemical products by cost savings, quality improvements, scale up and scale out, safety and the ability to handle new technologies and reagents. 3) **Supercritical fluids as non-conventional solvent** for the preparation of fine chemicals, where the solvent can be used not only as reaction media but also as a way to isolate the final product. I have developed processes using both supercritical CO₂ and/or supercritical water. Among other I developed



processes for key industrial processes (i.e. synthesis of important monomers terephthalic acid and ϵ -caprolactam) within the framework of the green chemistry. 5) **Advanced polymeric and soft materials** including tailor made catalytic, opto-electronic polymers and hybrid materials and their applications in organic field such catalysis, slow release, and energy application. 6) **Ionic Liquids**: One fundamental pillar of this research is the preparation of advanced materials based on the use of Ionic liquids (ILs). These polymeric ionic liquids combine some charming characters of ionic liquids with the general property profile of macromolecular architectures, and have found huge potential in energy-/environment-/catalysis-oriented applications, such as polymeric ion conductor, "smart" dispersants and stabilizers, powerful absorbents for solvent purification and CO₂ utilization, shaped carbon nanomaterial production, etc. 7) **Sensing** developing simple, fast and cheap sensor devices for the detection of allergens and VOC. All these tools can be combined and integrated in rational manner to achieve synergies allowing us to develop processes and chemical product with unique properties, while reducing the environmental impact of the chemical process by minimising the cost and maximising chemical efficiency.

The result of all this work is the publication > 110 articles (Hindex 36), 6 book chapters, communications to congresses, most of them international allowing a three positive evaluation of Research Sexennial Periods (2000-2005, 2006-2011, 2012-2017) and 9PHD thesis.

I have been always aware that working in the disruptive technologies and trying to transfer them to real practical applications. Thus, we have been working with different companies to apply our technologies and to evaluate their industrial potential (Dupont, Lilly, Jassen, InkimiaGreen Chemicals, IFF, IMAN).

I have participated in the creation of three transference projects. The first one related with the application of supported Ionic Liquid and related materials. The second one dealing with the hydro and organogels obtained with low molecular weight gelators. These two initiatives were supported by different transference programs but failed during the commercialisation phase but did not crystallise to technology base enterprise (EBT). However, a third initiative in collaboration with IMAN SL has led to EBT Proyecto Kryptonita dealing with the commercialization of fast and simple methods for detection of allergens in surface for the food industry-

Participation in different outreach activities related to Green Chemistry: Science Weeks at the UJI, talks for Primary students and in the Practica a L'UJI program for high school students. Participation at the Universidad de Mayores in UJI in regular courses. Participation in the monographic issue of the JACS in the field of Sustainable Chemistry (ACS Sust. Chem. Eng.) published in 2016 to commemorate the 25 years of the development of the concept of Green Chemistry, as well as in Newsletter 2 "The EU's climate action and the European Green Deal" by EUCHEMS (Chemical and Environment Division) published in 2021.

I cooperated with the University of Santiago de Cuba for the implementation of the postgraduate course in Sustainable Chemistry (2011). Organizer of the "Scientific Conference 3rd-10th Green Chemistry Workshop" at the UJI from 2013 to 2021 and Member of the Local Organizing Committee of "4th International Congress of Green Processes Engineering" 2014, Seville.

Part C. RELEVANT MERITS

C.1. Publications (relevant in the last 5 years)

1. F Esteve, B Altava, E García-Verdugo, SV Luis, JM Lehn, Doubly chiral pseudopeptidic macrobicyclic molecular cages: Water-assisted dynamic covalent self-assembly and chiral self-sorting, (2022), Chem, 8 (7), 2023-2042
2. D. Valverde, R. Porcar, M. Zanatta, S. Alcalde, B. Altava, V. Sans, E. Garcia-Verdugo, Towards highly efficient continuous-flow catalytic carbon dioxide cycloadditions with additively manufactured reactors, (2022), Green Chemistry, 24, 3300-3308, (doi.org/10.1039/D1GC04593H).
3. Valverde, D., Muñoz, I., García-Verdugo, E., Altava, B., Luis, S.V., Preparation of nanofibers mats derived from task-specific polymeric ionic liquid for sensing and catalytic applications, (2021) Polymers, 13 (18), art. no. 3110, DOI: 10.3390/polym13183110
4. Porcar, R., Lavandera, I., Lozano, P., Altava, B., Luis, S.V., Gotor-Fernández, V., García-Verdugo, E., Supported ionic liquid-like phases as efficient solid ionic solvents for the immobilisation of alcohol dehydrogenases towards the development of stereoselective



- bio-reductions, (2021) Green Chemistry, 23 (15), pp. 5609-5617. Cited 1 time. DOI: 10.1039/d1gc01767e
5. Villa, R., Porcar, R., Nieto, S., Donaire, A., Garcia-Verdugo, E., Luis, S.V., Lozano, P., Sustainable chemo-enzymatic synthesis of glycerol carbonate (meth)acrylate from glycidol and carbon dioxide enabled by ionic liquid technologies, (2021) Green Chemistry, 23 (11), pp. 4191-4200. DOI: 10.1039/d1gc01096d
6. Valverde, D., Porcar, R., Lozano, P., García-Verdugo, E., Luis, S.V. Multifunctional Polymers Based on Ionic Liquid and Rose Bengal Fragments for the Conversion of CO₂ to Carbonates, (2021) ACS Sustainable Chemistry and Engineering, 9 (5), pp. 2309-2318. 10.1021/acssuschemeng.0c08388
7. Villa, R., Alvarez, E., Nieto, S., Donaire, A., Garcia-Verdugo, E., Luis, S.V., Lozano, P., Chemo-enzymatic production of omega-3 monoacylglycerides using sponge-like ionic liquids and supercritical carbon dioxide, (2020) Green Chemistry, 22 (17), pp. 5701-5710.
8. Esteve, F., Altava, B., Burguete, M.I., Bolte, M., García-Verdugo, E., Luis, S.V., Pseudo-peptidic macrocycles as cooperative minimalistic synzyme systems for the remarkable activation and conversion of CO₂ in the presence of the chloride anion, (2020) Green Chemistry, 22 (14), pp. 4697-4705. DOI: 10.1039/d0gc01449d
9. Valverde, D., Porcar, R., Izquierdo, D., Burguete, M.I., Garcia-Verdugo, E., Luis, S.V., Rose Bengal Immobilized on Supported Ionic-Liquid-like Phases: An Efficient Photocatalyst for Batch and Flow Processes, (2019) ChemSusChem, 12 (17), pp. 3996-4004. DOI: 10.1002/cssc.201901533
10. Peris, E., Porcar, R., García-Álvarez, J., Burguete, M.I., García-Verdugo, E., Luis, S.V., Divergent Multistep Continuous Synthetic Transformations of Allylic Alcohol Enabled by Catalysts Immobilized in Ionic Liquid Phases, (2019) ChemSusChem, 12 (8), pp. 1684-1691. DOI: 10.1002/cssc.201900107
- C.2. Research projects and grants**
- 1.- **NUEVAS HERRAMIENTAS EN QUÍMICA VERDE PARA EL DESARROLLO DE PROCESOS (BIO)CATALÍTICOS SOSTENIBLES**, MINECO, PID2021-124695OB-C Date: 01/09/2022 to 30/08/2025. 169.400 €, IP: E. García Verdugo/Belén Altava.
- 2.- **“Líquidos iónicos y materiales relacionados para aplicaciones farmacológicas”**. GV-AICO/2021/139. Date: 01/01/2021 to 31/12/2023. 90000 €. IP: E. García Verdugo/Belén Altava.
- 3.- **In-situ and on-demand synthesis and use of H₂O₂ (in-situ H₂O₂)**, Projectes Pla de Promoció de la Investigació de la Universitat Jaume I – 2019-2202, 19.100 €, IP: E. García-Verdugo.
- 4- **Nuevos procesos multi-catalíticos verdes basados en la tecnología de los líquidos iónicos: desde la materias primas sencillas hasta los productos químicos con alto valor añadido**. MINECO, RTI2018-098233-B-C22, 2019-2021, 156.574 €, IP: S.V. Luis /E. García-Verdugo
- 5.- **CO₂ Activation by Enzymatic mimic based on pseudo-peptidic macrocycles** Projectes Pla de Promoció de la Investigació de la Universitat Jaume I – 2019-2202, 23.280 €, IP: E. García-Verdugo.
6. **Una aproximación a la sostenibilidad basada en sistemas multi-catalíticos inspirados en el modelo celular syncell, Grupos de Excelencia** GV-PROMETEO/2016/071, 2016-2020, 240.00046 €, IP: S.V. Luis
- 7-**Sistemas auto-organizados y auto-ensamblados para aplicaciones avanzadas**. MINECO, CTQ2015_68429R, 114000 €, IP: S.V. Luis
- 8-**Una aproximación biomimética a la sostenibilidad en química, Grupos de Excelencia** GV-PROMETEO/2012/020, 2012-2014, 161935 €, IP: S.V. Luis
- 9-**Nuevos retos en el desarrollo de compuestos pseudo-peptídicos en química supramolecular. Sistemas supramoleculares en medios acuosos**. CTQ2012-38543-C03-01 MINECO, 2012-2015, 129.870 euros, IP: S.V. Luis
- 10-**Química Supramolecular de compuestos pseudo-peptídicos: preorganización, reconocimiento molecular y autoensamblaje**. CTQ2009-14366-C02-01, 2009-2012, 100000 €, IP: S.V. Luis
- 11-**Nuevas metodologías sostenibles para la síntesis de aminas quirales**, UJI-Bankia, Ref. P1-1B2013-37, Importe: 36372 €, 2014-2016, I.P.: E. García-Verdugo.



12-Líquidos iónicos quirales: Nuevos disolventes, reactivos y catalizadores, BANCAJA, Ref. P1 1A2007-11, 16000 euros, 2007-2009, I.P.: E. García-Verdugo.

13- Solid Ionic Liquids. Proyecto incorporación. CSIC_MINN, 30000, 2010, I.P.: E. García-Verdugo.

14- Enabling techniques (técnicas facilitadoras) herramientas sostenibles para el desarrollo de procesos Químicos, MEC, CTQ2008-04309/BQU, 10890 euros, 2009, I.P.: E. García-Verdugo.

15-Green enantioselective catalyst for continuous asymmetric processes in supercritical fluids. MEIF-CT-2005-024963, 144.665.20 euros, 2006-2008, I.P.: E. García-Verdugo

C.3. Contracts

1. The Size/Neolith Evaluación de tecnologías para la descarbonilación aplicales a la industria cerámica. Inicio: 13.11.2021 Final: 22.12.2021. Importe: 5000 €. IP: E. Garcia-Verdugo, 2. INKEMIA GREEN CHEMICALS Inc, Desarrollo de agentes de esterilización más seguros. Inicio: 13.11.2020 Final: 31.07.2021. Importe: 27.021 €. IP: E. Garcia-Verdugo, S.V. Luis. 3. IFF BENICARLÓ SL, Reaction control by RAMAN technology, Inicio: 11.11.2020, Final: 10.04.2021 Importe: 5000 €. IP: E. Garcia-Verdugo. 4. Lilly, S.A.U., Evolución tecnológica del potencial de los fluidos supercríticos en procesos de reacción-separación, Inicio: 09.10.2020, Final: 9.04.2021 Importe: 9000 €. IP: E. Garcia-Verdugo. 5. INVESTIGACIÓN, ASESORAMIENTO Y ASISTENCIA TÉCNICA: Detección de alérgenos, IMAN, 2016-2017, IP: E. García-Verdugo, 3 researchers, 10350 €. 6. INVESTIGACIÓN, ASESORAMIENTO Y ASISTENCIA TÉCNICA, PROCTER AND GAMBLE /UNIVERSIDAD JAIME I, Sept. 2008-March 2009. IP: S.V. Luis, 3 researchers, participantes: 3, 20.000 €

C.4. Patents

1. P. A. Hamley, M Poliakoff, W.B. Thomas, E. Garcia-Verdugo, K. Whiston, *Title: PROCESS FOR PRODUCING AROMATIC DICARBOXYLIC ACIDS UNDER SUPERCRITICAL CONDITIONS, WO2004005235, DuPont Polyesters.* 2. P. A. Hamley, M Poliakoff, W.B. Thomas, E. Garcia-Verdugo, K. Whiston, *Title: PROCESS FOR PRODUCING HETEROAROMATIC CARBOXYLIC ACIDS, WO20060414572004, DuPont Polyesters.* 3. M Poliakoff, P. A. Hamley, C. Yan, E. Garcia-Verdugo, G.R. Aird, A. S.Coote, I. Pearson, W.B. Thomas, PREPARATION OF LACTAMS, **US 2006/0161000 A1**, Invista North America S.A.R.

C.5. Research supervision experience

- Supervisor of 9 PhD Chemistry thesis in the last years.
- Actual supervisor of 6 PhD Chemistry thesis.

C.6. Participation in International Congresses.

- Participation in more than 100 conferences and International Symposia.
- More than 30 oral communications in conferences and International Symposiums.

C.7. Organization of International Scientific Meetings and Meetings

- Member of the Local Organizing Committee of "4th International Congress of Green Processes Engineering" 2014, Seville.
- Organizer of the "1st-10th Workshop on Green Chemistry" organized at the Jaume I University, Castellon the years from 2012 to 2021

C.9. Participation in the organization and management of research.

- 2013 to 2016 Project Technical Advisor (PTA) of EU projects funded under the 7th Framework Program
- International Project Evaluator FONDECYT Program (Chilean National Science),
- International Project Evaluator Academy of Finland. EEAgrants. International evaluator of EEA & Norwegian Financial Mechanisms 2014-2021, Executive Agency for Higher Education, Research, Development and Innovation Funding, Romania.
- National evaluator for the Agencia Estatal de Investigación (ANEP) y AGAUR (Agency for Management of University and Research Grants).
- Evaluator Research Executive Agency (REA) FET-open calls.
- Chairman of the committee for the evaluation of "Proyectos de interés colaborativo (area QFM)" Agencia Andaluza del Conocimiento