



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 07/01/2023

First name	María del Pilar		
Family name	López Cornejo		
Gender (*)		Birth date	
Social Security, Passport, ID number			
e-mail		URL Web	
Open Researcher and Contributor ID (ORCID)	0000-0002-5825-9483		

A.1. Current position

Position	Full Professor in Physical Chemistry		
Initial date	21/12/2017		
Institution	University of Seville		
Department/Center	Physical Chemistry	Faculty of Chemistry	
Country	Spain	Teleph. Number	
Key words	DNA, lipids, supramolecular systems, calixarenes, carbon nanotubes, rotaxanes, drug nanocarriers, gene transfection, HIV		

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

Period	Position/Institution/Country/Interruption cause
01/08/1989-31/08/1989 01/08/1990-31/08/1990	Trainee chemist/Riotinto Minera S.A./Spain
01/01/1995-31/12/1994	Predoctoral Research Fellow/Fundación Cámara Urzáiz- Univ Sevilla/Spain
01/01/1995-31/12/1996	Postdoctoral Research Fellow/ University of Seville/ Spain
01/01/1997-31/12/1997	Postdoctoral Research Fellow/Ministerio de Educación y Ciencia/Spain-Portugal
18/10/1996-21/05/2002	Assistant Professor/University of Seville/Spain
22/05/2002-20/12/2017	Associate Professor/University of Seville/Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Licensed	University of Seville/Spain	1990
PhD	University of Seville/Spain	1994

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

My career details are: First Degree in Chemistry in 1990 (Univ. of Seville), PhD Cum Laude in Chemistry in 1994 (with a pre-doctoral grant, Cámara Urzaiz Foundation). Postdoctoral fellow in 1997 at the Higher Technical Institute of Lisbon under the direction of the Prof. S.M.B.Costa. Associate Lecturer (1996-2002), Senior Lecturer in Physical Chemistry (2002-2017) and Professor in Physical Chemistry (2017-*). Pre- and post-doctoral stays in UK and Portugal. Research line related to restricted geometry systems, macromolecules and colloids and ligand-receptor interactions. 3 books and 2 book chapters, 25 International Scientific Congresses (last 10 years) and President in ISMEC2006 and ICCK2013, respectively. Invited lectures at the Royal Academy of Science of Seville, the University of Huelva and Pharma Congress. In the last 10 years: I have participated in 2 Research Projects of Plan Nacional I+D+i, 3 Research Projects of the Junta de Andalucía (Principal Investigator), 2 grants to research



projects from Seville University (Principal Investigator) and several projects and grants of Junta de Andalucía. I have supervised 3 Doctoral Thesis and 1 more are under progress. Responsible for bilateral agreements Sevilla-Pisa and Sevilla-Hamburg (Erasmus Program), Sevilla-Tunisia and Sevilla-Ukraine (Erasmus +). Vocal member in the Colloids and Interface Group of the RSEQ for two years. Reviewer of several scientific journals of ACS, Elsevier, Springer, Royal Society, MDPI; and member of Editorial Board of Chemosensors (MDPI) IF: 4.229 Q1 (Instruments & Instrumentation). Four periods of international quality research, one period of management for the Andalusian Commission of Evaluation and Prospective, and five periods of six-years of international quality research from the National Committee for the Assessment of the Research Action (CNEAI) recognized. I collaborate with different Spanish and foreign research groups. This resulted in high impact publications. Led more than 25 TFGs and 6 TFMs in the Faculties of Chemistry and Pharmacy. Published 96 papers in indexed international journals (62% Q1, 24% Q2, 14% others), 33 papers in the last 10 years (300 citations).

Particular achievements in the last 10 years include: 1.- Influence that the rigidity/flexibility of calixarenes exerts on guest/host interactions was obtained; 2.- The use of kinetic studies as a tool to investigate DNA compaction was developed; 3.- It was demonstrated that, in the presence of high concentrations of some cationic surfactants, DNA compaction reverts and it is de-condensated. 4.-The reversibility of the protein denaturation and of the DNA compaction by cationic lipids, liposomes, metallosomes and metallomicelles were studied ; 5.-In contrast with previous results, it was demonstrated that dimeric surfactants with long spacers are more efficient DNA compacting agents than those with short and medium spacers; 6.- Cationic lipids derived from $[Ru(bpy)_3]^{2+}$ were synthesized to be used as building blocks in the construction of supramolecular systems. 7.- Interactions between ionic surfactants and carbon nanotubes were studied by ion selective electrodes and the driving forces in both adsorption and dispersion processes were discovered. 8.- Several drugs were encapsulated into nanocarriers of diverse nature, decreasing the toxicity of the antibiotics. 9.-Recently biocompatible nanoparticles have been synthesized in natural oils. The latter is being prepared to obtain a patent at the US. Nowadays our group is working on the preparation of biocompatible nanocarriers based on the use of calixarenes, metallomicelles, metallosomes, carbon nanotubes, MOFs, and polymers for encapsulating nucleic acids, antineoplastic drugs, amyloid proteins, antiretrovirals and Toll-like receptors.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications

- 1 Book Chapter.** López-Cornejo, P. et al. (1/6). Corresponding author. 2022. Metallosurfactants as Non-viral Vectors in Transfection. Chapter 8. Book Title "Metallosurfactants: From Fundamentals to Catalytic and Biomedical Applications". Wiley. 10.1002/9783527831289.ch8. ISBN: 978-3527348688.
- 2 Scientific paper.** Lebrón, J.A., López-López, M., García-Calderón, C.B., et al. (11/12). Corresponding author. 2021. Multivalent calixarene-based liposomes as platforms for gene and drug delivery. *Pharmaceutics* (13) 8. IF: 6.321 WOS. Q1. Cites: 10
- 3 Scientific paper.** Ostos, FJ, Lebron, JA, López-Cornejo, P.; Kalchenko, V.; Rodik, R. et al. (3/10) 2020. Self-aggregation in aqueous solution of amphiphilic cationic calix[4]arenes. Potential use as vectors and nanocarriers. *J. Molec. Liq.* 304, 112724. 10.1016/j.molliq.2020.112724. IF: 6.165 WOS. Q1. Cites: 13
- 4 Scientific paper.** Lebrón, José Antonio et al. (13/13). Corresponding author. 2020. Metallo-Liposomes of Ruthenium Used as Promising Vectors of Genetic Material. *Pharmaceutics* (12) 5, 482. 10.3390/pharmaceutics12050482. IF: 6.321 WOS. Q1. Cites: 5
- 5 Scientific paper.** Moya, M.L., Lopez-Lopez, M. et al. (9/9). Corresponding author. 2019. Preparation and Characterization of New Liposomes. Bactericidal Activity of Cefepime Encapsulated into Cationic Liposomes. *Pharmaceutics* (11) 2. <https://doi.org/10.3390/pharmaceutics11020057>. IF: 4.421 WOS. Q1. Cites: 27
- 6 Scientific paper.** López-López, Manuel et al. (2/9). 2018. Importance of hydrophobic interactions in the single-chained cationic surfactant-DNA complexation. *Journal of Colloid and Interface Science* (521)197-205. 10.1016/j.jcis.2018.03.048. IF: 6.622 WOS.Q1. Cites: 35
- 7 Scientific paper.** Martín, Victoria I. et al. (5/8). 2017. Host-guest interactions between cyclodextrins and surfactants with functional groups at the end of the hydrophobic tail. *Journal*



of Colloid and Interface Science (491) 336-348. 10.1016/j.jcis.2016.12.040. IF: 5.091 WOS. Q1. Citas: 15

8 Scientific paper. López-López, M. et al. (5/5). Corresponding author. 2016. Study of ionic surfactants interactions with carboxylated single-walled carbon nanotubes by using ion-selective electrodes. *Electrochemistry Communications* (67)31-34. 10.1016/j.elecom.2016.03.010. IF: 4.677 WOS. Q1. Citas: 12

9 Scientific paper. Lebron, J.A., Ostos, F.J. et al. (6/6). Corresponding author. 2015. Cooperative Interaction between Metallosurfactants, Derived from the $[\text{Ru}(2,2'\text{-bpy})_3]^{2+}$ complex, and DNA. *Colloids and Surfaces B-Biointerfaces* (135) 817-824. 10.1016/j.colsurfb.2015.08.052. IF: 3.902. WOS. Q1. Citas: 15

10 Scientific paper. Grueso, E. et al. (4/4). Corresponding author. 2012. Compaction and Decomposition of DNA Induced by the Cationic Surfactant CTAB. *Langmuir* (28) 10968-10979. 10.1021/la302373m IF: 4.187. WOS. Q1. Citas: 65

C.2. Congress

-Lebrón Romero, J.A., Pérez, D., Lopez-Lopez, M., López-Cornejo, P. et al. III Congreso de Jóvenes Investigadores (JIs) del Mar. Oral Communication. Motril (Granada). 2021

- Lopez-Lopez, M., Moya Morán, M.L., López-Cornejo, P. et al. Preparation and characterization of new liposomes. Bactericidal activity of cefepime encapsulated into cationic liposomes. Oral Communication. 2nd Spanish Conference on Biomedical Applications of Nanotechnology. Madrid. 2019

- Lopez-Cornejo, P., Lopez-Lopez, M., Moyá Morán, M.L., et al. Use of potentiometric measurements for the determination of surfactant-CNT interactions. Driving forces. Invited Oral Communication. XL Reunión del Grupo de Electroquímica de la Real Sociedad Española de Química y XX Encontro Ibérico de Electroquímica. Huelva. 2019

- Ostos Marcos, F. J., Lopez-Cornejo, P., Lopez-Lopez, M., et al. Influence of the Surfactant Degree of Oligomerization on the Formation of Cyclodextrin: Surfactant Inclusion Complexes. Oral Communication. 24th IUPAC International Conference on Physical Organic Chemistry. Faro, Portugal. 2018

- Martín Herrera, V. I., Lopez-Cornejo, P., Moyá Morán, M. L., et al. Stoppering/unstoppering of a rotaxane formed between an N-heterocycle ligand containing surfactant: β -cyclodextrin pseudorotaxane and pentacyanoferrate(II) ions. Oral Communication. VII Iberian Meeting on Colloids and Interfaces. Facultad de Ciencias Químicas, Universidad Complutense de Madrid, Madrid. 2017

- López-Cornejo, P., Lopez-Lopez, M., Bernal-Perez, et al. Ionic surfactant-carbon nanotube interactions. use of ion-selective electrodes. Oral Communication. VII Iberian Meeting on Colloids and Interfaces. 2017

- Bernal-Perez, E., Martín Herrera, V. I., Lopez-Cornejo, P., et al. Kinetics of the formation of a rotaxane from the end-capping process of a pseudorotaxane. Oral Communication. International Symposium on metal Complexes. Barcelona (Spain). 2016

-López-López, M., López-Cornejo, P. et al. Quenching processes under restricted geometry conditions: A quantitative treatment. Oral Communication. 9th International Conference on Chemical Kinetics. Ghent (Bélgica). 2015

- Moyá Morán, M.L., López-Cornejo, P., Lopez-Lopez, M., et al. Chemical reactions as sensors to determine DNA conformational changes in solution. Oral Communication. 20th International Symposium on Surfactants in Solution. Coimbra, Portugal. 2014

- López-Cornejo, P., García, J. P., Marron, E., et al. Role of the spacer in the interaction of 12-s-12 gemini surfactants (s=2, 10) to DNA. Poster. 8th International Conference on Chemical Kinetics. Sevilla (España). 2013

C.3. Research projects

1 Project. P20-01234. Junta de Andalucía. (05/10/2021-31/12/2022). 110.000 euros. Encapsulating agents based on the use of metal organic frameworks as new approaching to eradicate HIV. Responsible researcher.

2 Project. PP2020/IV.4/06. Plan Propio de la Universidad de Sevilla. (01/01/2020-31/12/2020). 5000 euros. Nuevos métodos para erradicar el VIH y aumentar la Respuesta Inmune a la vacuna del VHB usando redes metal orgánicas como agentes encapsulantes. Researcher (Preparation of nanoplatfoms, encapsulation of antiretroviral drugs and TLR agonists).



3 Project. PP2019-13266. Plan Propio de la Universidad de Sevilla. (01/01/2019-21/12/2019). 6000 euros. Nanoestructuras basadas en el uso de calixarenos con fines farmacológicos y biomédicos (NANOCALIX). Responsible Researcher.

4 Project. PP2018-10338. Plan Propio de la Universidad de Sevilla. (01/01/2018-21/12/2018). 6000 euros. Preparación y caracterización de nanoestructuras basadas en el uso de calixarenos con fines farmacológicos y biomédicos. Responsible Researcher.

5 Project. P12-FQM-1105. Proyectos de Excelencia de la Junta de Andalucía. 30/01/2014-16/06/2019). 187.000 euros. Nuevos Tensioactivos Biodegradables. Estudio de sus Propiedades Fisicoquímicas y Biológicas y de sus Interacciones con Especies de Potencial Interés Aplicado. Researcher (Synthesis of new surfactants, preparation of surfactant-based nanostructures, studies about the interaction surfactants or surfactant-based nanostructures with DNA and proteins).

6 Project. CTQ2009-07478. Ministerio de Ciencia y Tecnología. (01/01/2009-31/12/2013) 47.000 euros. Preparación y estudio de nuevos sistemas tensioactivos. Tensioactivos biodegradables de interés aplicado. Researcher (Synthesis and preparation of nanosystems to interact to nucleic acid)

7 Project. PP2017-8154. Plan Propio de la Universidad de Sevilla. (01/01/2017-31/12/2017). 5000 euros. Nuevos nanotransportadores para la administración de antibióticos beta-lactámicos por vía parenteral. Researcher (Synthesis of nanocarriers and encapsulation of antibiotics).

8 Project. P08-FQM-03623. Proyecto de Excelencia de la Junta de Andalucía. (01/1/2009-31/12/2013). 183.965,66 euros. Interacciones adn/ligandos: estudios cinéticos y termodinámicos. aplicación al desarrollo de vectores para transporte genético, al desarrollo de sensores y a las aplicaciones del ADN como catalizador. Researcher (Studies of interactions nanosystem/DNA).

9 Project. CTQ2008-0008. Ministerio de Ciencia y Tecnología. (01/01/2009-31/12/2012). 88.000 euros. Estudio termodinámico y cinético de la formación de complejos ligando/receptor y de la influencia de la formación de complejos en la reactividad química de los ligandos. Researcher (studies about the formation of ligand/receptor systems).

C.4. Contracts, technological or transfer merits

Contract: Responsable of the contract USE-21587-J. Contract for the development of the reference project P20_01234 derived from the R&D&I Aid, within the scope of the Andalusian Plan for Research, Development and Innovation (PAIDI 2020) and co-financed by the FEDER Operational Programme 2014-2020. Marta Martínez Santa (15 meses)

Contract: Member of Grupo Operativo NANO de la Junta de Andalucía (Univ. Sevilla, Univ. Huelva, SAT N°8697 Royal, Trichodex, Evenor Tech) Project GOP1L-SE-16-0003

Organization of Congress: President of the 8th International Conference on Chemical Kinetics. Seville, 8th-12th June 2013.

Editorial Board: Chemosensors. MDP Editorial. Q2. IF: 3.293

Transfer Merits: Publication in different media (IDESCUBRE, Andalucía Tech, twitter, linkelin, and electronic newspaper) of the research carried out. Some of them are:
<http://revista.lamardeonuba.es/investigadores-de-la-onubense-y-la-us-disenan-nanovectores-para-combatir-el-cancer-de-mana/>
https://www.lasexta.com/tecnologia-tecnoplora/sinc/nanoesferas-disminuir-efectos-secundarios-antibiotico_201904035ca486050cf2771403289c8a.html
<https://www.redaccionmedica.com/secciones/farmacia-hospitalaria/disenan-nanoesferas-para-facilitar-la-liberacion-prolongada-de-antibioticos-6655>

Awards:

-Research Award University of Seville-BRUKER 2017 to the work entitled Stopping/unstopping of a rotaxane formed between an N-heterocycle ligand containing surfactant: beta-cyclodextrin pseudorotaxane and pentacyanoferrate(II) ions, published in Journal of Colloids & Interface Science

-Supervisor of the research work titled "Cooperative interaction between metallosurfactants, derived from the $[Ru(bpy)_3]^{2+}$, and DNA" that won an award in the 14^o Certamen Universitario Arquímedes (Ministerio de Educación, Cultura y Deporte, 2015).