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AGENCIA  
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## 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	07/06/2023
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First name	María Soledad		
Family name	Cárdenas Aranzana		
Gender (*)	Female	Date of Birth (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail	qa1caarm@uco.es	URL Web	<a href="https://www.uco.es/grupos/FQM-215/">https://www.uco.es/grupos/FQM-215/</a>
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-4155-8284		

(\*) Mandatory

#### A.1. Current position

Position	Full Professor of Analytical Chemistry		
Initial date	20/10/2009		
Institution	University of Córdoba		
Department/Centre	Department of Analytical Chemistry. Faculty of Sciences		
Country	Spain	Phone number	+34 957 218616
Keywords	Affordable and sustainable sample treatment, polymeric (nano)composites; cellulose-based sorptive phases; mass spectrometry		

#### A.2. Previous positions (research activity interruptions)

Period	Position/Institution/Country/Cause of the interruption
1993-1996	PhD Student. Predoctoral Fellowship (UCO, Spain)
1998-2002	Profesora Asociada (UCO, Spain)
2002-2009	Profesora Titular de Universidad (UCO, Spain)
2009-continue	Catedrática de Universidad (UCO, Spain)

#### A.3. Education

PhD, Graduate Degree	University/Country	Year
Chemistry, Bachelor Degree	University of Córdoba	1992
Sciences (Chemistry) PhD	University of Córdoba	1996

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

M<sup>a</sup> Soledad Cárdenas Aranzana is Full Professor at the Department of Analytical Chemistry (University of Córdoba, UCO). She obtained her Degree in Chemistry (1992) and Doctorate in Sciences (1996) with European mention and extraordinary award, in the UCO. She has developed her teaching career under different positions, being currently Full Professor (2009). During her Doctoral Thesis she proposed different flow-injection based analytical methods for the development of different endogenous compounds (fatty acids and cholesterol) and exogenous (abuse drugs) in biological fluids by mass spectrometry. During this period, she spent 1 month at Prof. Jordi Segura research group (IMIM, Hospital del Mar, Barcelona, Spain), reference in antidoping control analysis and 3 months at the research group of Prof.



Ad de Jong (Laboratory for Organic-Analytical Chemistry, National Institute of Public Health and the Environment, Bilthoven, The Netherlands) reference in organic analysis by mass spectrometry).

She continued the postdoctoral period moving the research interest to the qualitative analysis developing rapid methodologies aimed at providing information that allowed the analyst to classify samples as positive or negative thus minimized the number of samples to be further analysed by conventional or routine methods. She was involved on two European projects led by the group on the topic. Also, she started supervising visiting students as well as the co-direction of Doctoral Thesis, being the one defended in 2001. From 2005 her research was focused on Nanoscience and Nanotechnology, evaluating the potential of nanoparticles (especially carbonaceous one) in the simplification of sample treatment, taking advantage of their outstanding properties as sorbent materials.

Since 2016, she is the head of the FQM-215 research group (<https://www.uco.es/grupos/FQM-215/>). Now, her research interest is related to the incorporation of sustainable materials in sample preparation. In this regard, the immobilization of the polymeric phases, nanoparticles or composite materials over other lignocellulosic substrates (paper, cotton or wood) is under evaluation. They are used in different microextraction formats or directly analyzed by ambient mass spectrometry (either by direct infusion or paper spray).

Since the beginning of her scientific career, she has co-authored 248 research articles in JCR journals, which have received 8502 citations (h-index 51, January 2023, Scopus). She has also published 21 book chapters and presented 210 communications in national and international scientific meetings under different formats. She has co-edited two books in the field of Sample Treatment edited by Bentham and Elsevier. Concerning competitive funding, she has continuously participated as researcher in eight national and four regional research projects. Since 2014, she is principal investigator in three national and two regional projects and a thematic network on sample treatment, all obtained in competitive calls. She is member of the European Committee of the EuChemS-DAC Sample Treatment Study Group.

She has supervised 10 PhD students granted with an FPU-program fellowship and co-supervised 20 Doctoral Thesis, 15 with European/International mention and 4 with extraordinary doctorate award. They are all active professionals in public and private sector companies. The research group headed by her has received international predoctoral students from Iran, Argentina, Germany, Portugal, Chile, Brazil and Tunisia. In the international context, she has participated in 5 European research projects and acted as external adviser of two ones funded by the Indigo Program (one of them currently under development). Also, she has been involved in 8 contracts with private (6, one international with Henkel KGaA) and public (2) companies. Additionally, she participates in a collaborative project established between the research group and the International University of Florida. She has coauthored two patents and was founded partner of the spin-off Sinatec. Concerning international assessment activities, she is evaluator for the Portuguese Foundation for Science and Technology, the Czech Science Foundation, FONDECYT (Chile) and the National Agency for Scientific and Technological Promotion (Argentina). She is collaborator of the Spanish Research Agency (former ANEP) since 2003 and also of regional agencies. Concerning the recruitment of researchers, she has been member of the Evaluation Commission of Juan de la Cierva and FPU programs. She has been president of the A3- Chemistry Commission of the ACADEMIA program of the National Quality Assessment and Accreditation Agency of Spain (ANECA, 2016-2019). Concerning academic management activities, she is currently Vice-Chancellor for Academic Affairs and Competitiveness at the University of Córdoba.

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

### **C.1. Publications**

1. Millán-Santiago, J., Lucena, R., Cárdenas, S\*. (2022). Pre-cleaned bare wooden toothpicks for the determination of drugs in oral fluid by mass spectrometry. *Anal. Bioanal. Chem.*, 414, 5287–5296. Paper in forefront. Topical collection Promising Early-Career (Bio)Analytical Researchers.



2. Benedé, J.L., Chisvert, A.; Lucena, R.; Cárdenas, S.\* (2021). A paper-based polystyrene/nylon Janus platform for the microextraction of UV filters in water samples as proof-of-concept. *Microchimica Acta*, 188, 391.
3. Millán-Santiago, J., García-Valverde, M.T., Lucena, R., Cárdenas, S\*. (2021). Polyamide-coated wooden tips coupled to direct infusion mass spectrometry, a high throughput alternative for the determination of methadone, cocaine and methamphetamine in oral fluid. *Microchem. J.*, 162, 105843.
4. Benedé, J.L\*., Chisvert, A.; Lucena, R.; Cárdenas, S.\* (2021). Carbon fibers as green and sustainable sorbent for the extraction of isoflavones from environmental waters. *Talanta*, 233, 122582.
5. Casado-Carmona, F. A., Lucena, R., Cárdenas, S.\* (2021). Magnetic paper-based sorptive phase for enhanced mass transference in stir membrane environmental samplers. *Talanta*, 228, 122217. Front cover.
6. Ríos-Gómez, J.; García-Valverde, M.T.; López-Lorente, Á.I.; Toledo-Neira, C.; Lucena, R.\*; Cárdenas, S. (2020). Polymeric ionic liquid immobilized onto paper as sorptive phase in microextraction. *Anal. Chim. Acta.* 1094, 47-56.
7. Díaz-Liñán M.C., García-Valverde M.T., López-Lorente A.I., \*; Cárdenas S., Lucena R. (2020) Silver nanoflower-coated paper as dual substrate for surface-enhanced Raman spectroscopy and ambient pressure mass spectrometry analysis. *Anal. Bioanal. Chem.* 412, 3547-3557.
8. García-Valverde M.T, Soriano M.L., Lucena R, Cárdenas S.\* (2020) Cotton fibers functionalized with  $\beta$ -cyclodextrins as selectivity enhancer for the direct infusion mass spectrometric determination of cocaine and methamphetamine in saliva samples. *Anal. Chim. Acta*, 1126, 133-143.
9. Díaz-Liñán, M.C., A.I. López-Lorente\*, Lucena, R., Cárdenas, S. (2019). Molecularly imprinted paper-based analytical device obtained by a polymerization-free synthesis. *Sensors and Actuators, B: Chemical.* 287, 138-146.
10. Mehmandost, N., Soriano, M.L., Lucena, R., Goudarzi, N., Chamjangali, M.A., Cardenas, S.\* (2019) Recycled polystyrene-cotton composites, giving a second life to plastic residues for environmental remediation. *Journal of Environmental Chemical Engineering* 7, 103424.

## C.2. Congresses

1. "Preparación de fases sorbentes a partir de materiales naturales. Aplicación en el ámbito del tratamiento de muestras". XVIII Jornadas Científicas del Instituto Universitario de Materiales. Alicante (España) (21-22/01 2022). Invited lecture.
2. "Hybrid monolithic solids and their potential in microextraction techniques". 5<sup>th</sup> International Caparica Christmas Conference on Sample Treatment. Caparica (Portugal) (15-18/11 2021). Oral communication.
3. "Simplicity, sustainability, and synergy: the 3-S commitment of cellulosic supports to sample preparation". 23<sup>rd</sup> International Symposium on Advances in Extraction Technologies (ExTech). On-line congress (30/6-2/7 2021). Keynote.
4. "Paper-based sorptive phases in sample preparation". Innovations in Sample Preparation: a virtual symposium (LC/GC). On-line congress (18/09/ 2021). Invited Lecture.
5. "Synthesis of nanoparticle-based hybrid monoliths and their potential in microextracion techniques". 4<sup>th</sup> International Caparica Christmas Conference on Sample Treatment. On-line congress (30/11-03/12 2021). Oral communication.
6. "Fases sorbentes con nanomaterials preparadas sobre papel: do it yourself!". XXII Reunión de la Sociedad Española de Química Analítica (Valladolid, Spain) (17-18/07 2019). Invited Lecture.
7. "Nanotecnología en el análisis de alimentos". Nanotecnología y Alimentación (Food) (Benasque, Spain) (3-7/07 2019). Invited Lecture.

## C.3. Research projects

### As Principal Investigator

1. Project PDC2021-120900-I00. "Muestreadores de aire basados en ventiladores". Period: 2021-2023. Funding: 74.750,00 €. Principal investigators: M<sup>a</sup> Soledad Cárdenas Aranzana and Rafael Lucena Rodríguez.



2. Project PID2020-112862RB-I00. "Sustratos (bio)poliméricos para la determinación de opioides en biofluidos mediante espectrometría de masas ambiental". Period: 2021-2024. Funding: 145.200,00 €. Principal investigators: M<sup>a</sup> Soledad Cárdenas Aranzana and Rafael Lucena Rodríguez.
3. Project CTQ-2017-83175R. "Avances en técnicas de microextracción y nanoplataformas sensoras". Period: 2018-2020. Funding 156.090,00 €. Principal investigators: M<sup>a</sup> Soledad Cárdenas Aranzana and Rafael Lucena Rodríguez.
4. Project CTQ2014-52939R "Aproximaciones nanotecnológicas y miniaturizadas para la generación de información (bio)química de calidad". Period: 2015-2018. Funding: 278.000 €. Principal investigators: M.<sup>a</sup> Soledad Cárdenas Aranzana and Rafael Lucena Rodríguez
5. Thematic network RED2018-102522-T "Red nacional para la innovación en las técnicas de tratamiento de muestras miniaturizadas". Principal investigator: M<sup>a</sup> Soledad Cárdenas Aranzana. Period: 2020-2022. Funding: 20.000 euros.

#### As researcher

1. Project DTS20/00117. "Desarrollo y validación de nuevos nanofármacos para el tratamiento de la enfermedad metabólica asociada a obesidad e hipogonadismo". Period: 2021-2022. Funding: 97.790,00 €. Principal investigator: Manuel Tena Sempere.
2. Thematic network AGL2016-81993REDT "Red Nacional de Excelencia en Nanotecnología y Alimentación (Food) E-9". Period 2017-2019. Funding: 20.000,00 €. Principal Investigator: José Manuel Barat Baviera. Universidad Politécnica de Valencia. Participation: Responsible for WP: Nanosensors applied to food
3. CTQ2011-23790. Aproximaciones miniaturizadas y nanotecnológicas a los sistemas analíticos de vanguardia-retaguardia. Ministerio de Ciencia e Innovación. Period: 2012-2015. Funding: 465.850,00 €.
4. FP7-280550. (INSTANT). Innovative Sensor for the fast Analysis of Nanoparticles in Selected Target Products. European Commission. Period: 2012-2015. Funding: 442.140,00 €.
5. Proyecto de excelencia FQM-4801. Nanopartículas de carbono, metálicas e híbridas como analitos y herramientas químico-analítica. Junta de Andalucía. Period: 2009-2012. Funding: 250.931,68 €.

#### **C.4. Technology/Knowledge transfer**

##### Contracts

##### As responsible

1. Company: Aguas de Córdoba. Calidad de las aguas de la provincia de Córdoba. 2016-2018. 80.582,00 €
2. Company: COVAP. Asesoramiento en el tratamiento de muestras de leche en el marco del proyecto BIOFOS. 2016-2016. 1.996,00 €

##### As researcher

3. Company: EMPROACSA. Calidad de las aguas de la provincia de Córdoba. 2010-2015. 197.938 €.
4. Asociación Nacional de Criadores de Ganado Bovino de Raza Cárdena Andaluza. Puesta a punto de técnicas de nanosexaje del esperma de toros de la raza bovina Cárdena Andaluza. 2018-2019. 2.500,00 €.

##### Patents and Transference activities

1. Dispositivo y procedimiento de muestreo y monitorización de componentes volátiles en aire. Application n<sup>o</sup>: P202030192. Date: 06/03/2020. S. Cárdenas, R. Lucena, M.C. Alcudia León, F.C. Casado Carmona, G. Lasarte Aragonés.
2. Dispositivo de muestreo ambiental. Application n<sup>o</sup>: P20213100. Date: 25/10/2021. R. Lucena, S. Cárdenas, F.A. Casado Carmona, J.M. Jiménez Soto.
3. Founded partner of the spin-off Sinatec (2007-2013), at the moment detached from the UCO.