 

**CURRICULUM VITAE (maximum 4 pages)**

//

|  |  |
| --- | --- |
| **CV date** | 20/10/2021 |

# Part A. PERSONAL INFORMATION

|  |  |  |  |
| --- | --- | --- | --- |
| First and Family name | Rafael Lucena Rodríguez | | |
| Social Security, Passport, ID number | 30836901L | Age | 43 |
| Researcher codes | Open Researcher and Contributor ID (ORCID\*\*) | 0000-0002-4625-2460 | |
| SCOPUS Author ID (\*) | 8517312100 | |
| WoS Researcher ID (\*) | B-7759-2008 | |

*(\*) Optional. (\*\*) Mandatory*

# Current position

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name of University/Institution | University of Córdoba | | | | |
| Department | Analytical Chemistry Department | | | | |
| Address and Country | Marie Curie building (annex). Campus de Rabanales | | | | |
| Phone number | +34957211066 | E-mail | [rafael.lucena@uco.ess](mailto:rafael.lucena@uco.ess) | | |
| Current position | Profesor titular | | | From | 2018 |
| Key words | Microextraction techniques, polymeric (nano)composites; (ligno)cellulose-based sorptive phases; mass spectrometry | | | | |

* 1. **Education**

|  |  |  |
| --- | --- | --- |
| PhD, Licensed, Graduate | University | Year |
| Chemistry, Bachelor Degree | University of Córdoba | 2001 |
| Sciences (Chemistry) PhD | University of Córdoba | 2006 |

* 1. **General indicators of quality of scientific production** *(see instructions)*

|  |  |
| --- | --- |
| Indicator | Value |
| Six-year research periods (CNEAI) | 3 out of 3 possible (last: 2019) |
| Doctoral Thesis (co)supervised (2010-2019) | 7, 5 of them with international mention. |
| Scientific articles | 122 (Scopus) |
| Total citations | 3745 (Scopus) |
| Citations per year in the last 5 years (2015-2019) | 377 (Scopus) |
| H-index | 34 (Scopus) |
| Percentage of cited articles | 95.5% |

# Part B. CV SUMMARY

Rafael Lucena is professor of Analytical Chemistry since 2010. He studied Chemistry at the University of Córdoba, getting his BSc with an extraordinary end of studies award. His Thesis was focused on the development of multiparametric analyzers. It was presented in 2006 with European mention and doctoral award.

From September to December 2003, he spent three months in the group of Pr. Bernhard Lendl at the Technical University of Vienna (Austria) learning the basics of Sequential Injection Analysis and Infrared Spectroscopy. From July to October 2005, he was working in the group of Pr. Wolfgang Lindner at the Central University of Vienna. In these three months, he was working, under the supervision of Dr. Norbert Maier, in the determination of Ochratoxin A in different foodstuff by high- performance liquid chromatography-fluorescence detection.

Up to date, he has co-authored 122 scientific articles (h-index: 34, Scopus) dealing with different analytical aspects, although microextraction techniques are the main core of his research. He has co- edited one special volume in Anal. Bioanal. Chem. journal and an e-book on the topic. He has edited a book for Elsevier dedicated to sample preparation. In addition, he is editing a blog (Microextraction Tech) focused on sample treatment techniques.

He teaches different facets of Analytical Chemistry in several degrees (Chemistry, Environmental Sciences, and Food Chemistry) and Masters. In this sense, he has been involved in the Erasmus Mundus Master in Forensic Sciences organized by three European academic institutions. Currently, he is participating in the Plurilingualism Program of the University of Cordoba that involves teaching in

English to national and international students. Rafael has directed 9 Ph.D. Thesis. Currently, he is supervising 4 Thesis, one of them in co-tutelle with the University of Tunis el Manar (Tunisia).

Rafael is the secretary of the Research Institute of Fine Chemistry and Nanochemistry, an organization that involves more than 125 researchers in different areas of Chemistry. Also, he has been involved in the organization of several meetings like NANOUCO, a monographic conference on Nanochemistry.

He also acts as a reviewer in many journals and project evaluator for some funding agencies. He is currently associate editor of Advances in Sample Preparation (Elsevier).

Rafael has been extensively working on the development of new microextraction techniques and materials to be used in the analytical sample preparation context. He is entirely aware of the responsibility (social, environmental) of the research, and in the last years, his research has been focused on the design of simple and cheap (easily transferable to other laboratories, no matter their resources) materials based on lignocellulosic (sustainable) substrates. The reuse and recycling of polymer residues and the design of remediation approaches (based on sorption or photocatalysis) can be highlighted as his contribution to reducing the environmental impact of Chemistry.

# Part C. RELEVANT MERITS

* 1. **Publications.** Selection of 10 publications related to the topic of the talk

## Synthesis of cotton-based sorbents

1. García-Valverde, M.T., Soriano, M.L., Lucena, R., Cárdenas, S. 2020. Cotton fibers functionalized with β-cyclodextrins as selectivity enhancer for the direct infusion mass spectrometric determination of cocaine and methamphetamine in saliva samples. Anal Chim. Acta 1126, 133-143.
2. García-Valverde, M.T.; Lucena, R.; Cárdenas, S.; Valcárcel, M. 2016. In-syringe dispersive micro- solid phase extraction using carbon fibres for the determination of chlorophenols in human urine by gas chromatography/mass spectrometry. J Chromatogr A. 1464, 42-49.

## Synthesis of paper-based planar substrates for sample treatment

1. Díaz-Liñán, M.C.; García-Valverde, M.T.; Lucena, R.; Cárdenas, S.; López-Lorente, A.I. 2020. Dual-template molecularly imprinted paper for the determination of drugs of abuse in saliva samples by direct infusion mass spectrometry. Microchem J. 160, 105686.
2. Díaz-Liñán M.C.; García-Valverde M.T.; Lucena R.; Cárdenas S, López-Lorente AI. 2020. Paper- based sorptive phases for microextraction and sensing. Anal Methods. 12, 3074-3091.
3. Díaz-Liñán, M.C.; López Lorente, A.I.; Cárdenas, S.; Lucena, R. 2019. Molecularly imprinted paper- based analytical device obtained by a polymerization-free analysis. Sensors and Actuators B: Chemical, 287, 138-146.
4. Rios- Gómez, J.; Lucena, R.; Cárdenas, S. 2017. Paper supported polystyrene membranes for thin film microextraction. Microchem. J. 133, 90-95.
5. Benedé, J.L., Chisvert, A., Lucena, R., Cárdenas, S. 2021. Synergistic combination of polyamide- coated paper-based sorptive phase for the extraction of antibiotics in saliva. Analytica Chimica Acta, 1164, art. no. 338512.
6. 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, art. no. 122217,

## Direct analysis by mass spectrometry

1. 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.
2. Ríos-Gómez, J., Fresco-Cala, B., García-Valverde, M.T., Lucena, R., Cárdenas, S. 2018. Carbon nanohorn suprastructures on a paper support as a sorptive phase. Molecules, 23 (6), art. no. 1252.

# Research projects

## As Principal Investigator

1. PID2020-112862RB-I00. Sustratos (bio)poliméricos para la determinación de opioides en biofluidos mediante espectrometría de masas ambiental (2BIO4MS). Ministerio de Ciencia e Innovación. Period: 2021-2024. Funding: 145.200,00 €.
2. CTQ2017-83175R. Avances en técnicas de microextracción y nanoplataformas sensoras. Ministerio de Economía, Industria y Competitividad. Period: 2018-2020. Funding: 156.090,00 €.
3. CTQ2014-52939R. Aproximaciones nanotecnológicas y miniaturizadas para la generación de información (bio)química de calidad. Ministerio de Ciencia e Innovación. Period: 2015-2017. Funding: 336.380,00 €.

## As researcher

1. RED2018-102522-T. Red nacional para la innovación en las técnicas de tratamiento de muestras miniaturizadas. Ministerio de Ciencia, Innovación y Universidades. Period: 2020-2021. Funding: 20.000,00 €.
2. UCO-1262884. Nuevos materiales para la degradación/eliminación de contaminantes en aguas naturales. Junta de Andalucía. Period. 2020-2021. Funding: 35.000,00 €.
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 €.

# Contracts, technological or transfer merits

## As researcher

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 €
3. Company: EMPROACSA. Calidad de las aguas de la provincia de Córdoba. 2010-2015. 197.938,22

€.

# Patents

1. Cárdenas, S.; Lucena, R.; Alcudia-León, M.C.; Casado-Carmona, F.C.; Lasarte-Aragonés, G. Dispositivo y procedimiento de muestreo y monitorización de componentes volátiles en aire. Application nº: P202030192. Date: 06/03/2020.

# Co-supervised doctoral Thesis (last 10 years)

1. PhD student: Julia Ríos Gómez. Title: Soportes planos modificados con nuevos materiales sorbentes en técnicas de microextracción. Thesis defense: December 2018. Mark: Sobresaliente cum laude, international mention. FPU grant
2. PhD student: María Teresa García Valverde. Title: Potencial de nanomateriales tubulares no convencionales en el tratamiento de muestra. Thesis defense: November 2018. Mark: Sobresaliente cum laude, international mention, FPI grant.
3. PhD student: Emilia María Reyes Gallardo. Title: Empleo de nanopartículas híbridas en el contexto de las técnicas de microextracción. Thesis defense: April 2017. Mark: Sobresaliente cum laude, onal mention. FPU grant.
4. PhD student: Mercedes Roldán Pijuán. Title: Innovaciones en técnicas de microextracción con agitación integrada. Thesis defense: April 2015. Mark: Sobresaliente cum laude, intenational mention. FPU grant.
5. PhD student: Guillermo Lasarte Aragonés. Title: Mejora de las técnicas de microextracción mediante el diseño de nuevas modalidades asistidas por CO2. Thesis defense: October 2014. Mark: Sobresaliente cum laude. FPU grant
6. PhD student: Francisco Galán Cano. Title: Innovaciones en técnicas de extracción miniaturizadas. Thesis defense: March 2013. Mark: Sobresaliente cum laude.
7. PhD student: Mª del Carmen Alcudia León. Title: Innovaciones en técnicas de microextracción combinadas con técnicas espectroscópicas y cromatográficas. Thesis defense: July 2011. Mark: Sobresaliente cum laude, international mention. FPU grant.

In the last year, we are receiving international students for doing their PhD Thesis. Currently, a student (Saloua Hammadi) from the Tunis el Manar University (Tunisia) is doing her Thesis under the co-tulle

mode. Also, a PhD student from the Dominican Republic (Jorge Emilio Cuevas) has registered his doctoral project.

# Evaluation activities

Reviewer of 588 scientific articles (67 articles per year in the last 5 years) in reputed journals. The complete profile can be found at the Publons webpage https://publons.com/researcher/1259231/rafael- lucena

Evaluation of Research projects for the following agencies:

Agencia estatal de investigación (Spain) since 2018 Czech Science Foundation, since 2020.

Comisión Nacional de Investigación Científica y Tecnológica (Chile) since 2017.

# International collaborations and profile

1. Member of the American Chemical Society (ACS) and American Society of Mass Spectrometry (ASMS).
2. Member of the European Committee of the EuChemS-DAC Sample Preparation Study Group and Network. Co-Leader of the working group “WG3. Information Exchange and Networking” from EuChemS-DAC Sample Preparation Task Force and Network”.
3. Publications in collaboration with international research groups coming from USA, Brazil, Chile, Greece, Iran (two different groups), Argentina, Portugal and Austria. In the last year, the next collaborations have been initiated: Prof. Mercolini (Bologna University, Italy), Prof. Mardones (Universidad de Concepción Chile).
4. Participation as speaker in different international forums including pre-courses and conferences (only those related to the topic of the proposal are indicated)
   1. 2017. *9th International Symposium on Advances in Extraction Technologies (Santiago de Compostela). Oral presentation. Paper sorptive phases*
   2. 2018. *XIII Simposio Latinoamericano de Química Analítica y Ambiental-2018. Pre-*

*Congress course (invited): Nuevas tendencias en preparación de muestra*

* 1. *2018. ·XIII Simposio Latinoamericano de Química Analítica y Ambiental-2018. Keynote lectura (invited). Nuevas fases sorbentes planas en el tratamiento de muestra.*
  2. *2018. 3rd International Caparica Christmas Conference on Sample Treatment. Keynote lecture (invited). Sorptive phases based on coating conventional paper with polymer/nanoparticles composites.*
  3. *2020. 1st Webinar Series on Molecules– an Open Access Journal. Sample Preparation, Quo Vadis: Current Status of Sample Preparation Approaches. Oral presentation (invited). Paper-Based Sorptive Extraction*
  4. *2020. 3rd Webinar Series of the Red Latinoamericana para el Análisis de la Calidad Ambiental en América Latina, (RACAL). Oral presentation (invited). Materiales (ligno)celulósicos en microextracción*
  5. *2020. 4th International Caparica Christmas Conference on Sample Treatment. Plenary lecture (invited). Planar sorptive phases for microextraction and beyond.*
  6. *2021. 1st European Sample Preparation e-Conference, Oral presentation (invited) 11*

*– 12 March, 2021. Sustainable supports for microextraction.*

* 1. *2021. XIII Workshop em avanços recentes no preparo de Amostras, Oral presentation (invited). October 11th, Paper based sorptive phases, from simple coatings to Janus substrates..*