CURRICULUM VITAE (CVA)

CV date	26/10/23

Part A. PERSONAL INFORMATION

First name	Álvaro	
Family name	Colina Santamaría	
e-mail	acolina@ubu.es	https://investigacion.ubu.es/investigadores/35071/detalle
Open Research and Contributor ID (ORCID)(*)	0000-0003-0339-356X	

(*) Mandatory

A.1. Current position

Position	Professor of Analytical Chemistry		
Initial date	6/10/2021		
Institution	Universidad de Burgos		
Departament/Center	Departament of Chemisry/ Faculty of Science		
Country	Spain	Teleph. number	+34947258817
Keywords	Spectroelectrochemistry, Electrochemistry, Spectroscopy, UV/Vis absorption, Raman, photoluminescence, nanomaterials		

A.2. Previous positions (research activity interruptions, art. 45.2.c))

Period	Position/Institution/Country/Interruption cause
1996-207	Profesor Asociado/Universidad de Burgos
2007-2009	Profesor Contratado Doctor Fijo/Universidad de Burgos
2009-2021	Profesor Titular de Universidad/Universidad de Burgos

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Bachelor in Chemistry	Universidad de Valladolid	1994
PhD in Chemistry	Universidad de Burgos	2001

Part B. CV SUMMARY

Bsc from the University of Valladolid and PhD from the University of Burgos (UBU). FPU Scholar in 1995. Full-time Profesor Asociado in 1996. Since then I have been working at the UBU, being Professor in 2021 (3 research periods and 1 of transference). I have been simultaneously teaching and researching since the beginning of my career. I also carried out management tasks. I was Vice Dean of the Faculty of Sciences (2012-2016), coordinator of the Master in Advanced Chemistry (2012-2016) and coordinator of the Doctorate in Advanced Chemistry of the UBU (2012-2020). I stayed in Prof. Unwin's group at the University of Warwick (UK) in 2006. My research has been focused on Spectroelectrochemistry (SEC) since 1994 when I started working with Prof. Jesús López-Palacios, when he created the Instrumental Analysis group. Our group has been a pioneer in the development of spectroelectrochemical techniques and devices in Spain and we are one of the most active groups in this field in the world. The big difference with other groups that uses SEC is that we always use this technique with high temporal resolution. We have developed Bidimensional SEC, Three-dimensional SEC, SEC at L/L interfaces, Bipolar SEC, Spatial Scanning SEC, SEC in screen-printed electrodes, low-

resolution Raman SEC, time-resolved Raman SEC, simultaneous Raman and UV/Vis SEC, simultaneous SECM and UV/Vis SEC usually these techniques have been designed to solve problems of our collaborators. Since the group's first patents, we have pursued the transference of our technology to commercial companies in order to facilitate the use of the SEC by other researchers. As a culmination of 20 years of work in SEC, in 2014 we developed in collaboration with Metrohm Dropsens S.L. the first worldwide commercial compact and integrated SEC UV/Vis instrument, and during the year 2017 we developed the first worldwide compact commercial SEC Raman instrument. In 2018 we discovered EC-SOERS, a phenomenon of amplification of the Raman signal during the electrochemical oxidation of silver. We collaborate with high level national and international groups. Since our beginnings, we have been growing with the intention of having a well-grounded internal structure and collaborators that allow us to grow up in quality to reach a high position in national and international Electrochemistry. Our techniques have been used successfully in the study of very different chemical systems such as complexes, conductive polymers, metallic nanoparticles, carbon nanotubes, graphene, hybrid materials, molecules of biological interest, etc. SEC has reached a state of maturity that will promote its use in the study of many chemical systems and will be a common tool in many laboratories. Our group prioritizes the quality of publications over quantity and we hope to continue improving the impact of our publications. Author of 100 articles in JCR, most of them in high quality journals. We receive a good number of citations, with a clear increase in the last 5 years. We expect that being SEC commercially available, our impact in the scientific community will increase. I have participated in two scientific networks in the last years funded by Ministerio de Ciencia e Innovación (RED2018-102412-T and CTQ2015-71955-REDT) entitled “Red de sensores y biosensores electroquímicos”. In 2015 we received the CIDETEC award for Scientific Research in Electrochemistry, which is the most prestigious in this field. I have supervised 10 PhD Thesis. One of them, Dr. Garoz, supervised by me received the Antonio Aldaz award for the best thesis in Electrochemistry in Spain in 2018. Nowadays, I am supervising 3 Ph D students. I was International Society of Electrochemistry Regional Representative of Spain, leader of “Instrumental Analysis group” at the Universidad de Burgos from 2012, reviewer of journals for Elservier, ACS, Springer, RSC and evaluator of projects for the AEI and other international agencies.

Part C. RELEVANT MERITS

C.1. Publications

1. Brosseau, C. L.; Colina, A.; Perales-Rondon, J. V.; Wilson, A. J.; Joshi, P. B.; Ren, B.; Wang, X. Electrochemical Surface-Enhanced Raman Spectroscopy. **NATURE REVIEWS METHODS PRIMERS** (2023), 3, 79.
2. Hernandez, S.; Perez-estebanez, M.; Cheuquepan, W.; Perales-rondon, J. V. Raman, UV − Vis Absorption, and Fluorescence Spectroelectrochemistry for Studying the Enhancement of the Raman Scattering Using Nanocrystals Activated by Metal Cations. **ANALYTICAL CHEMISTRY** (2023) *accepted*
3. Perales-Rondon, J. V.; Hernandez, S.; Gonzalez-Baro, A. C.; Heras, A.; Colina, A. Simultaneous Scanning Electrochemical Microscopy and UV–Vis Absorption Spectroelectrochemistry. **ANALYTICAL CHEMISTRY** (2023) 95, 10532–10539.
4. Hernandez, S., Perales-Rondon, J.V., Heras, A., Colina, A. *“Simultaneous Raman and Reflection UV/Vis absorption Spectroelectrochemistry* **NANORESEARCH** (2022) 15 (6), 5340–5346.
5. S. Hernandez, J. V Perales-Rondon, A. Heras, A. Colina. “Enhancement factors in electrochemical surface oxidation enhanced Raman scattering” **ELECTROCHIMICA ACTA** (2021) 138223
6. Perales-Rondon, Colina, A, González, M.C., Escarpa, A. “Roughened silver microtubes for reproducible and quantitative SERS using a template-assisted electrosynthesis approach” **APPLIED MATERIALS TODAY** (2020), 10071

7. J. V. Perales-Rondon, S. Hernandez, D. Martin-Yerga, P. Fanjul-Bolado, A. Heras, A. Colina, "Electrochemical surface oxidation enhanced Raman scattering", **ELECTROCHIM. ACTA**. 282 (2018) 377–383
8. D. Ibañez, E. Valles, E. Gomez, A. Colina, A. Heras, "Janus Electrochemistry: Asymmetric Functionalization in One Step", **ACS APPL. MATER. INTERFACES**. 9 (2017) 35404–35410.
9. D. Ibañez, A. Heras, A. Colina, "Bipolar Spectroelectrochemistry", **ANAL. CHEM**. 89 (2017) 3879–3883
10. J. Garoz-Ruiz, A. Heras, A. Colina, "Direct Determination of Ascorbic Acid in a Grapefruit: Paving the Way for In Vivo Spectroelectrochemistry", **ANAL. CHEM**. 89 (2017) 1815-1822.

C.2. Congress

1. *"On the Capabilites of Electrochemical Surface Oxidaton Enhanced Raman Scattering for Analysis". Electrochem 2023* (Bristol, UK). **2023**. ***Keynote***.
2. *"Unveiling the Origin of the Raman Enhancement During the Oxidation of Metal Electrodes". 74TH* Annual Meeting of the International Society of Electrochemistry (Lyon, France). **2023**. ***Oral communication***.
3. ***"****Design of analytical strategies for the electrochemical enhancement of the Raman signal". XXXVIII Reunión Bienal de la Real Sociedad Española de Química (Granada)* ***2022. Invited Oral.***
4. *"Electrochemical Surface Oxidation-Enhanced Raman Scattering on Copper: A New Phenomenon for Analysis".* 71st Annual Meeting of the International Society of Electrochemistry (Jeju, Korea). **2021**. ***Oral communication***.
5. *"Recent Advances in Electrochemical Surface Oxidation-Enhanced Raman Spectroscopy".* 71st Annual Meeting of the International Society of Electrochemistry (Belgrade, Serbia). **2020**. ***Oral communication***.
6. *"New Insights in Surface Oxidation Enhanced Raman Scattering Spectroelectrochemistry".* XL Meeting of the Electrochemistry Group of the Spanish Royal Society of ChemistryXX Iberian Meeting of Electrochemistry. Huelva (España) **2019.** ***Keynote.***
7. "*Surface Oxidation Enhanced Raman Scattering Spectroelectrochemistry".* XXXIX Meeting of the Electrochemistry Group of the Spanish Royal Society of Chemistry and 3rd E3 Mediterranean Symposium.Madrid (España) **2018.** ***Keynote.***
8. "*Spectroelectrochemistry of Graphene Quantum Dots*". 69th Annual Meeting of the International Society of Electrochemistry. Bolonia (Italia). **2018**. ***Oral communication***.
9. "*Spectroelectrochemistry: a tool to study nanomaterials*". DIPC School on PhotoElectroCatalysis at the Atomic Scale (San Sebastian). **2017**. ***Invited Oral communication***
10. *"Development of a new device for simultaneous UV-Vis absorption and Raman Spectroelectrochemistry".* 67th Annual Meeting of the International Society of Electrochemistry (La Haya, Holanda). 2016 ***Oral communication***.

C.3. Research projects

1. **PID2020-113154RB-C21** "*Aplicación de nuevos materiales y dispositivos para EC-SERS Y EC-SOERS*" ***Ministerio de Ciencia e Innovación*** IP: Alvaro Colina Santamaría (Universidad de Burgos), Duration: 01/09/2021 – 31/08/2024. Funding: 133.100 €. Role: *Principal Investigator*

2. **Grant Agreement number: 861962** "*GHz nanoscale electrical and dielectric measurement of the solid-electrolyte interface and applications in the battery manufacturing line H2020-NMBP-TO-IND-2019 DT-NMBP-08-2019*" ***European Comission***, IP: Edgar Ventosa Arbaizar (Universidad de Burgos), Duration: 01/05/2020–31/03/2023. Funding: 190.937,50 €. Role: *Investigator*.
3. **CTQ2017-83935-R** "*Espectroelectroquímica Raman Cuantitativa*" ***Ministerio de Economía y Competitividad***, IP: Alvaro Colina Santamaría (Universidad de Burgos), Duration: 01/01/2018 – 31/12/2020. Funding: 68.970€. Role: *Principal Investigator*.
4. **BU297P18** "*Fusión de técnicas espectroelectroquímicas*" ***Junta de Castilla y León***, IP: Aránzazu Heras Vidaurre (Universidad de Burgos), Duration: 01/01/2018 – 31/12/2020. Funding: 120.000 €. **Role**: *Investigator*.
5. **BU033U16** "*Desarrollo de un equipo compacto de espectroelectroquímica Raman*" ***Junta de Castilla y León***, IP: Aránzazu Heras Vidaurre (Universidad de Burgos), Duration: 01/01/2016 – 31/12/2018. Funding: 120.000 €. Role: *Investigator*.
6. **BU033U16** "*Desarrollo de un equipo compacto de espectroelectroquímica Raman*" ***Junta de Castilla y León***, IP: Aránzazu Heras Vidaurre (Universidad de Burgos), Duration: 01/01/2016 – 31/12/2018. Funding: 120.000 €. Role: *Investigator*.
7. **CTQ2014-55583-R** "*Espectroelectroquímica multifuncional: desarrollo de sensores para análisis in-situ*" ***Ministerio de Economía y Competitividad***, IP: Alvaro Colina Santamaría (Universidad de Burgos), Duration: 01/01/2015 – 31/12/2017. Funding: 58.000 €. Role: *Principal Investigator.*
8. **CTQ2014-61914-EXP** "*Preparación en una sola etapa de membranas conductoras tipo Janus formadas por nanoestructuras metálicas sobre películas de nanotubos de carbono monocapa sin soporte físico*" ***Ministerio de Economía y Competitividad***, IP: Aránzazu Heras Vidaurre (Universidad de Burgos), Duration: 01/09/2015 – 31/08/2017. Funding: 72.600 €. Role: *Principal Investigator*.
9. **BU349U13** "*Desarrollo de un equipo compacto de espectroelectroquímica de absorción en el UV/Vis*" ***Junta de Castilla y León***, IP: Aránzazu Heras Vidaurre (Universidad de Burgos), Duration: 01/01/2013 – 31/12/2014. Funding: 29.700 €. Role: *Investigator*.
10. **CTQ2010-17127** "*Seguimiento espectroelectroquímico del proceso de electrosíntesis de agregados y nanocristales metálicos*". ***Ministerio de Ciencia e Innovación***. IP: Álvaro Colina Santamaría (Universidad de Burgos). Duration: 01/01/2011 – 30/06/2014. Funding: 60.000 €. Role: *Principal Investigator*.

C.4. Contracts, technological or transfer merits

- **License for know-how contract**: "*Dispositivos e instrumentación para medidas espectroelectroquímicas*". *IPs*: ÁLVARO COLINA SANTAMARÍA, ARÁNZAZU HERAS VIDAURRE. *Company*: **Metrohm DropSens** *Duration*: 22/01/2014-21/01/2020. Funding based on sales.
- **License for know-how contract** "*Dispositivos e instrumentación para medidas de espectroelectroquímica Raman IPs*: ÁLVARO COLINA SANTAMARÍA, ARÁNZAZU HERAS VIDAURRE. *Company*: **Metrohm DropSens**, *Duration*: 15/05/2017-14/05/2023. Funding based on sales.