

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	23/01/24
First name	Alejandro		
Family name	Rodríguez Pascual		
Gender (*)	Male	Birth date	13/05/1976
Social Security, Passport, ID number	30829580N		
e-mail	a.rodriuez@uco.es	URL Web	https://biopren.es/
Open Researcher and Contributor ID (ORCID) (*)	0000-0001-8196-5848		

A.1. Current position

Position	Full professor		
Initial date	29/05/21		
Institution	Universidad de Córdoba		
Department/Center	Inorganic Chemistry and Chemical Engineering	Science Faculty	
Country	Spain	Teleph. number	+34 957 21 22 74
Key words	Procesos Químicos (330303); Química Industrial (330311); Ingeniería de Procesos (331005) Cellulose, pulp, paper, organosolv, soda, bleaching, oxygen, lignin, lignocellulosic residues, valorization, biorefinery, nanofibrillar cellulose, hemicellulose, packaging, biobased composites		

A.2. Previous positions (research activity interruptions, see call)

Period	Position/Institution/Country/Interruption cause
01/06/2001 → 01/10/2002	Researcher / Univ. de Córdoba / Spain
03/10/2002 → 26/09/2004	Profesor Ayudante / Univ. Pablo de Olavide / Spain
27/09/2004 → 31/12/2006	Profesor Ayudante Doctor / Univ. Pablo de Olavide / Spain
01/01/2007 → 26/11/2011	Contratado Ramón y Cajal / Univ. de Córdoba / Spain
27/11/2011 → 28/05/2021	Profesor Titular / Univ. de Córdoba / Spain

A.3. Education

PhD	University/Country	Year
PhD Sciences	Universidad de Córdoba / Spain	2002
Licensed	University	Licensed
Chemistry	Universidad de Córdoba / Spain	1999
Science and Food Technology	Universidad de Córdoba / Spain	2001

Part B. CV SUMMARY (max. 5000 characters, including spaces) *to complete this section, please read carefully: "Instructions to fill CVA"*

Normalized impact of their scientific production → 2.872 date of calculation 2022. Period of analysis (2017-2020) under following methodology: 2020 call for the granting of accreditations and public aid for "Severo Ochoa Centers of Excellence" and "María de Maeztu Units of Excellence" of the State Program for the Generation of Knowledge and Scientific and Technological Strengthening of the R&D&I System.

3 six-year research periods (max possible) evaluated (last 01/01/2018). **11 doctoral thesis supervised**, currently supervising 3. **Google Scholar h=42, i10=102, total cites 5560, Scopus h=38, total cites 4087. 132 JCR articles.** 100% of the published works from 2008 have been cited. More than 40% of the articles published in the last 8 years have been international collaborations. Dr from University of Córdoba in 2002. He worked as "Profesor Ayudante and Ayudante Doctor" from 2002 to 2006 at Pablo de Olavide University, Seville. In January 2007 he joined the Chem. Eng. Area of the University of Córdoba with a "Ramón y Cajal" Contract (call 2006). Professor since 27/11/2011 and Full Professor since 29/05/2021.



In 2007 applicant began to integrate biorefinery processes in the research line in which the thesis was did. The objective was the valorization of lignocellulosic waste from agri-food activities. In 2013, it began working on obtaining cellulose nanofibers from agricultural residue, being one of the first groups at international level to do so. It was also demonstrated with several publications the goodness of having hemicelluloses in the celluloses to be nanofibrillated. Nanocelluloses with lignin content were also obtained by means of mechanical pretreatment not studied so far, obtaining as a conclusion that the presence of lignin is indeed beneficial. In recent years, research has been carried out in various applications, focusing on the food packaging sector, where we have developed different packaging solutions (rigid, films, coatings) with excellent results in food preservation. We have actively collaborated with the Hibro research group of the UCO, experts in predictive microbiology and food. Currently I am collaborating with Andalusian SMEs in the search for strategies for the valorization of lignocellulosic wastes from agri-food activities. He has organized three editions of the International Congress on Biorefinery of Lignocellulosic Materials, with an average participation of 100 researchers from 19 countries, increasing with this action the international position. Since 2020 we have participated in 5 European proposals (H2020 and Prima) with success in two of them. I have supervised 11 theses to date. 100% of them are working in science-related activities (universities, research centers or private companies). Expert evaluator for several international and national research agencies (REA, Romania, Latvia, Chile, Uruguay, Cyprus, etc.). Active collaboration with more than 10 foreign entities. And recipient of international visiting professors. Founding partner of Spin off OrganInk SL. I am currently lead of the RNM 940 group (PAIDI), Director of a university master's degree and General Director of Transfer and OTRI. Wide experience regarding dissemination activities; mass media (TV, press and radio), Café con Ciencia, La Noche de los Investigadores, Ingenios en Ruta, Bocados de Ciencia, Patios de Ciencia, etc.

Part C. RELEVANT MERITS

C.1. Publications

- 1)** E. Espinosa, Q. Tarrés, M. Delgado-Aguilar, I. González, P. Mutjé, A. Rodríguez. 2016. Suitability of wheat straw semichemical pulp for the fabrication of lignocellulosic nanofibres and their application to papermaking slurries. *Cellulose*, 23(1), 837-852. 10.1007/s10570-015-0807-8
- 2)** Juan Domínguez-Robles, Rafael Sánchez, Pilar Díaz-Carrasco, Eduardo Espinosa, María Trinidad García-Domínguez, Alejandro Rodríguez. 2017. Isolation and characterization of lignins from wheat straw: application as binder in lithium batteries, *Int. J. of Biological Macromolecules*, 104, 909-918. 10.1016/j.ijbiomac.2017.07.015
- 3)** Juan Domínguez-Robles, Tarja Tamminen, Tiina Liitiä, María Soledad Peresin, Alejandro Rodríguez, Anna-Stiina Jääskeläinen. 2018. Aqueous acetone fractionation of kraft, organosolv and soda lignins. *Int. J. of Biological Macromolecules*, 106, 979-987. 10.1016/j.ijbiomac.2017.08.102
- 4)** Eduardo Espinosa, Fleur Rol, Julien Bras, Alejandro Rodríguez. 2019. Production of lignocellulose nanofibers from wheat straw by different fibrillation methods. Comparison of its viability in cardboard recycling process. *Journal of Cleaner Production* 239 118083. 10.1016/j.jclepro.2019.118083
- 5)** Eduardo Espinosa, Fleur Rol, Julien Bras, Alejandro Rodríguez. 2020. Use of multi-factorial analysis to determine the quality of cellulose nanofibers. Effect of nanofibrillation treatment and residual lignin content. *Cellulose Volume 27*, pages 10689–10705. 10.1007/s10570-020-03136-3
- 6)** Eduardo Espinosa, Rafael Isaías Arrebola, Isabel Bascón-Villegas, Mónica Sánchez-Gutiérrez, Juan Domínguez-Robles, Alejandro Rodríguez. 2020. Industrial application of orange tree nanocellulose as papermaking reinforcement agent. *Cellulose*, 27(18), 10781-10797. 10.1007/s10570-020-03353-w
- 7)** Laura M. Sanchez, Eduardo Espinosa, Pedro Mendoza Zélis, Ramón Morcillo Martín, Jorge de Haro Niza, Alejandro Rodríguez. 2022. Cellulose nanofibers/PVA blend polymeric beads containing in-situ prepared magnetic nanorods as dye pollutants adsorbents. *Int. J. of Biological Macromolecules*, Volume 209, Part A, Pages 1211-1221. 10.1016/j.ijbiomac.2022.04.142
- 8)** E. Espinosa, E. Rincón, R. Morcillo-Martín, L. Rabasco-Vílches, A. Rodríguez. 2022. Orange peel waste biorefinery in multi-component cascade approach: Polyphenolic



compounds and nanocellulose for food packaging. *Ind. Crops and Products*, 187, 115413. 10.1016/j.indcrop.2022.115413

9) Sergio Carrasco, Eduardo Espinosa, Zoilo González, Manuel Cruz-Yusta, Luis Sánchez, and Alejandro Rodríguez. 2023. Simple Route to Prepare Composite Nanocellulose Aerogels: A Case of Photocatalytic De-NO_x Materials Application. *ACS Sustainable Chem. Eng.* 11, 6, 2354–2363. 10.1021/acssuschemeng.2c06170

10) Ramón Morcillo-Martín, Laura Rabasco-Vílchez, Eduardo Espinosa, Fernando Pérez-Rodríguez, Alejandro Rodríguez. 2023. Raspberry (*Rubus idaeus* L.) waste-derived nanocellulose for circular application in edible films and coatings. *LWT Food Science and Technology*, Volume 188, 115438. 10.1016/j.lwt.2023.115438

C.2. Congress

1) Alejandro Rodríguez, Eduardo Espinosa, Quim Tarrés, Marc Delgado-Aguilar, Pere Mutjé, Luis Jiménez. Nanofibrillar cellulose (NFC) obtained from wheat straw. Oral. ICNF 2015. 2nd International Conference on Natural Fibers. Ponta Delgada, Azores, Portugal, abril 27-29, 2015

2) Alejandro Rodríguez. Integral utilization of lignocellulosic materials; residues of the agriculture and agri-food industry. Oral. World Congress and Expo on Recycling. Barcelona, España, julio 20-22, 2015.

3) Alejandro Rodríguez, Eduardo Espinosa, Rafael Sánchez, Juan Domínguez-Robles. Wheat straw lignonanofibers as alternative source to use in paper and paperboard industry. Oral. I&S International Workshop on Insights and Strategies Towards a Bio-Based Economy. Montevideo, Uruguay, noviembre 22-25, 2016

4) Juan Domínguez-Robles, Rafael Sánchez, Eduardo Espinosa, Pilar Díaz, Álvaro Caballero, M.T. García-Domínguez, Alejandro Rodríguez. How the operational conditions influence in the physico-chemical properties of the lignin? Oral. 10th World Congress of Chemical Engineering, WCCE 2017. Barcelona, España, octubre 1-5, 2017.

5) Alejandro Rodríguez, Eduardo Espinosa, Juan Domínguez-Robles, Isabel Bascón, Rafael Sánchez. Wheat straw valorization. Much more than bread. Oral. 4th Iberoamerican Congress on Biorefineries. Jaén, España, octubre, 24-26, 2018.

6) Alejandro Rodríguez Pascual. Bioeconomía y desarrollo sostenible. Biorrefinería de residuos agroalimentarios. Oral. Workshop: productos y nanomateriales a partir de biorrefinerías agroforestales. Concepción, Chile, 22-23, marzo 2022.

7) Alejandro Rodríguez Pascual. Importance of dissemination and outreach for (small) research groups. Oral (invited). WIRE MC Meeting and Workshops. Portalegre, Portugal, 10-12 Mayo 2022.

8) Alejandro Rodríguez. Sustainable development through the valorization of agri-food lignocellulosic residues. Oral (invited). Polymer-based materials today and in the future, NKS Makro. Høsbjør (Noruega), 2-3 marzo 2023.

9) Alejandro Rodríguez, Eduardo Espinosa, Esther Rincón. Biopolymers and food packaging solutions. Keynote. WCCE11 - 11th World Congress of Chemical Engineering. Buenos Aires, Argentina, 4-8 June 2023

10) Alejandro Rodríguez, Eduardo Espinosa, Esther Rincón. Aprovechamiento de residuos agroindustriales en el marco de la economía circular. Keynote (invited). EXPOTECH 2023 Ciencia, Tecnología e Innovación al servicio de un futuro ético y responsable para la industria 5.0. Medellín, Colombia, 4-6 octubre 2023.

C.3. Research projects

.- Integrated utilization of agricultural residues for the production of paper and other products. Plan Nacional I+D+i (Ramón y Cajal Program). 01-01-2007 to 12-31-2011 PI: Alejandro Rodríguez. 183.800 €

.- Development of a biorefinery process of lignocellulosic materials. Fractionation by autohydrolysis and pulping operations. CTQ 2010-19844-C02-01. Plan Nacional I+D+i (MICINN). 01-01-2011 to 12-31-2013 PI: Luis Jiménez Alcaide. 162.140 €. Researcher.

.- Biorefinery of agricultural residues. Benefit of hemicellulose, cellulose and lignin. TEP-6261. Consejería de Economía Innovación y Ciencia. 03-15-2011 to 03-15-2015 PI: Alejandro Rodríguez. 44.500 €

.- Study of sequences of thermo-chemical treatments for the optimization of integrated biorefinery applied to fast-growing crops and agricultural wastes. CTQ2013-46804-C2-2-R. Plan Nacional I+D+i (MICINN). 01/01/2014 to 31/12/2016 PI: Alejandro Rodríguez. 185.130 €



- Lignin-based nanofiber of cellulose from agrifood waste for application in functional and sustainable food packaging. CTQ2016-78729-R. Plan Nacional I+D+i (MICINN). 30/12/2016 to 29/12/2019 PI: Alejandro Rodríguez. 96.800 €
- Valorización de residuos agrícolas mediante la obtención de productos útiles para la industria agroalimentaria (VALORE). Consejería de Conocimiento, Investigación y Universidad: Convocatoria PAIDI 2020. 01-01-2020 to 30-06-2023. PI: Alejandro Rodríguez and Elena Carrasco. 108.292,01 €
- BIOFRESHCLOUD-Enhancing Mediterranean Fresh Produce Shelf-life using Sustainable Preservative Technologies and communicating knowledge on dynamic shelf-life using Food Cloud Services and Predictive Modelling. PRIMA S2 2019. 01/06/2020 to 31/05/2023. PI: Fernando Pérez Rodríguez. 200.000 €. WP leader
- Valorizing horticultural crop residues for developing sustainable food preservation and packaging systems: Toward zero waste with a biorefinery approach (AgroVal4PackFood). PID2020-117718RB-I00. 01-09-2021 to 31-08-2024 PI: Alejandro Rodríguez and Fernando Pérez. 229.900 €.
- Obtención de envases funcionales alimentarios a partir de biopolímeros degradables, biomasa y extractos de origen vegetal. Consejería de Conocimiento, Investigación y Universidad: Convocatoria PAIDI 2020. 01-01-22 to 31-12-2022. PI: Alejandro Rodríguez and Elena Carrasco 24.500 €

C.4. Contracts, technological or transfer merits

- Study of the suitability of olive and orange pruning for the production of cellulose pulp in a semi-industrial plant. TRA-2009_0064. Ministerio de Ciencia y Tecnología. 01/03/2010 to 29/02/2012 PI: Luis Jiménez Alcaide. 72.600 €. Researcher
- Estudio de la viabilidad del uso de residuos lignocelulósicos de la industria agroalimentaria para la fabricación de pasta de celulosa. Campos del Sol Agrícola SL. 15/04/2017 to 15/10/2017 PI: Alejandro Rodríguez 11.374€
- Production of LCNF. AINIA. 25/01/2018 to 25/07/2018 PI: Alejandro Rodríguez 2.662 €
- Nanofibras de celulosa a partir de paja de arroz. AINIA. 01/06/2018 to 01/12/2018. PI: Alejandro Rodríguez. 2.923,93 €
- Use of fruit and vegetable waste for the manufacture of useful containers in the agri-food sector (ENVAGRO). Consejería de Economía, Conocimiento, Empresas y Universidad. Dirección General de Investigación y Transferencia del Conocimiento. 01/12/2019 to 31/05/2021. PI: Alejandro Rodríguez Pascual. 75.530€
- Support for the start-up of a new production line for -micro- and nano-celluloses at laboratory scale. AINIA. 03/09/2019 to 03/01/2020 PI: Alejandro Rodríguez Pascual 3.496,9€
- Asesoría Científico-Técnica en la implantación del Departamento de I+D. BIOTECH Digital Solutions SL. 01-01-2020 to 01-07-2020 PI: Alejandro Rodríguez Pascual. 5.082€
- Producción de nanocelulosa ultrapura para uso como biotinta en bioimpresión 3D. REGEMAT 3D. 03-06-2020 to 03-06-2022. PI: Alejandro Rodríguez Pascual. 4.840 €
- Producción de celulosa de alto grado de polimerización. Obtención de NFC. COTTON SOUTH S.L. 01-01-2022 to 31-12-2024. PI: Alejandro Rodríguez Pascual. 79.860 €
- Desarrollo de Hidrogeles Funcionales de Base Biológica Para Bioimpresión 3d y Transferencia al Sector Biomédico (Hidrom3d) AT21_00143. Incentivos a los Agentes del Sistema Andaluz del Conocimiento Ayudas a la I+D+I, (Paidi 2020), Junta De Andalucía. 15-07-2022 HASTA: 31-05-2023 PI: Alejandro Rodríguez Pascual y Eduardo Espinosa Víctor. 71.500 €

Patents

- National invention patent No. 117193 "Polyphenolic extract, methods and uses thereof". Portuguese Patent and Trademark Office. Priority date: 22/04/2021. Applicants: Portuguese Catholic University (UCP) and University of Cordoba (UCO).
- National invention patent No. P202130530 "Procedure for obtaining cellulosic fibres from various agricultural waste and cellulosic tray". Spanish Patent and Trademark Office. Priority date 09/06/2021. Applicant: University of Cordoba