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| <b>Fecha del CVA</b> | 15-12-2023 |
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**Parte A. DATOS PERSONALES**

|                                      |                             |                     |  |
|--------------------------------------|-----------------------------|---------------------|--|
| Nombre y apellidos                   | Natividad Ortega Santamaría |                     |  |
| Núm. identificación del investigador | Researcher ID               | V-2541-2017         |  |
|                                      | Código Orcid                | 0000-0001-6269-7577 |  |

**A.1. Situación profesional actual**

|                       |   |                    |  |
|-----------------------|---|--------------------|--|
| Organismo             | Universidad de Burgos   |                    |  |
| Dpto./Centro          | Biotecnología y Ciencia de los Alimentos  |                    |  |
| Dirección             | Plaza Misael Bañuelos s/n   |                    |  |
| Teléfono              | 258800  | correo electrónico | <a href="mailto:nortega@ubu.es">nortega@ubu.es</a> |
| Categoría profesional | CAUN  |                    | Fecha inicio                                       |
| Espec. cód. UNESCO    | 230209 – 330203 – 251101 – 330999 (enzimas en alimentos)  |                    |  |
| Palabras clave        | Enzyme technology; microbial enzyme production; biocatalysts immobilization; enzymes in food processing; authentication of olive oil by molecular biology maker; qPCR; RT-qPCR, gene expression quantification. |                    |  |

**A.2. Formación académica (título, institución, fecha)**

| Licenciatura/Grado/Doctorado    | Universidad               | Año  |
|---------------------------------|---------------------------|------|
| Licenciado en Ciencias Químicas | Universidad de Valladolid | 1990 |
| Graduada en Ciencias Químicas   | Universidad de Valladolid | 1990 |
| Doctorado en Ciencias Químicas  | Universidad de Burgos     | 1996 |

**A.3. Indicadores generales de calidad de la producción científica**

Nº sexenios: 4 - Fecha último sexenio: 31-12-2018

Nº Tesis doctorales dirigidas (últimos 10 años): 5

Citas totales: 1.299 (Fuente Web of Science)

Publicaciones en primer cuartil (Q1): 35

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**Parte B. RESUMEN LIBRE DEL CURRÍCULUM (máximo 3500 caracteres, incluyendo espacios en blanco)**

Graduated in Chemical Science and PhD from the University of Burgos (1996). During her training period she made a stay at the Dipartimento di Scienze del Suolo e Nutrizione della Pianta. Università degli Studi di Firenze under the direction of Dr. Paolo Nannipieri. In this period, she acquired knowledge and experience on effect of pesticides (atrazine, carbaryl, glyphosate and paraquat) on the activity of the soil urease. In 1994, she joined the area of Biochemistry and Molecular Biology at the University of Burgos as Assistant Professor, and in 2002 she became as University Professor (PTUN: 2002-2022, CAUN: 2022-today). She has participated in 17 research projects (European, state and regional calls) (1 of them as principal investigator) and in three contracts with companies (2 as principal investigation). The development of these projects has given her experience in research and project management and a solid background in Enzyme Biotechnology (production and immobilization of enzymes) for application in the agri-food and environmental sector. In addition, for ten years she has focused in the application of molecular techniques (design of specific molecular markers, qPCR, RT-qPCR techniques for quantification of gene expression...) for: (i) food authentication (olive oil traceability, identification and quantification of plant species...) and (ii) study the gene expression of mitochondrial genes in cells treated with potential anticancer drugs.

In the short and medium term, the scientific-technical objectives of the research will deepen the study of the alteration of gene expression and the mitochondrial stress of plants used in the phytoremediation of water with heavy metal content (BIOSYSMO project). Moreover, the

lines on the development and design of enzymatic processes and the authentication of olive oil by molecular techniques also remain active.

Highlight, the regularity in scientific production throughout the years of her professional career with 4 six-year research periods: 42 research articles in journals indexed in the JRC database (35 Q1), 3 book chapters and, the presentation of a hundred communications to Congresses both nationally and internationally. She has participated as an evaluator of research projects (Agrifood) in various calls of the National Agency for Evaluation and Foresight (ANEP) (Ministry of Science and Innovation, Spain).

Finally, it should be noted that he has participated in the direction of 5 Doctoral Theses, 28 Master's Theses and numerous End-of-Degree Projects.

The teaching curriculum begins from the 1994-95 academic year to the present in the Area of Biochemistry and Molecular Biology from the University of Burgos. It has three positive evaluations of the Docencia program. He has taught multiple subjects in different Bachelor's, Bachelor's and Master's degrees. It should be noted that since the 2013-14 academic year in the Master's Degree in Food Safety and Biotechnology, she is the coordinator of the subject Molecular Genetics Techniques for quality control and food safety.

### **Parte C. MÉRITOS MÁS RELEVANTES** (*ordenados por tipología*)

#### **C.1. Publications: 2012 to 2022 and related to the requested project**

1. **Ortega N**, Sáez L, Palacios D, Busto MD (2022). Kinetic modeling, thermodynamic approach and molecular dynamics simulation of thermal inactivation of lipases from *Burkholderia cepacia* and *Rhizomucor miehei*. *Int J Mol Sci*, 23, 6828
2. Palacios D, Busto MD, Albillos SM, **Ortega N** (2022) Synthesis and oxidative stability of monoacylglycerols containing polyunsaturated fatty acids by enzymatic glycerolysis in a solvent-free system. *LWT-Food Sci Technol* 154, 112600
3. Busto MD, González-Temiño Y, Albillos SM, Ramos-Gómez S, Pilar-Izquierdo MC, Palacios D, **Ortega N** (2022). Microencapsulation of a commercial food-grade protease by spray drying in linked chitosan particles. *Foods*, 11, 2077
4. Echevarría I, Zafon E, Barrabés S, Martínez MA, Ramos-Gómez S, **Ortega N**, Manzano BR, Jalón FA, Quesada R, Espino G, Massaguer A (2022). Rational design of mitochondria targeted thiabendazole-based Ir(III) byscyclometalated complexes for a multimodal photodynamic therapy of cancer. *J Inorg Biochem*, 231, 111790
5. González-Temiño Y, Ruíz MO, **Ortega N**, Ramos-Gómez S, Busto MD (2021). Immobilization of naringinase on asymmetric organic membranes: application for debittering of grapefruit juice. *Innov Food Sci Emerg Technol* 73, 102790
6. Mvila BG, Pilar-Izquierdo MC, Busto MD, Pérez-Mateos M, **Ortega N** (2020). Barley seed coating with urease and phosphatase to improve N and P uptake. *Sci Agric*, 77, e20180227
7. Palacios D, **Ortega N**, Rubio-Rodríguez N, Busto MD (2019). Lipase-catalyzed glycerolysis of anchovy oil in a solvent-free system: Simultaneous optimization of monoacylglycerol synthesis and end-product oxidative stability. *Food Chem*, 271, 372-379
8. Ruiz E, Busto MD, Ramos-Gómez S, Palacios D, Pilar-Izquierdo MC, **Ortega N** (2018). Encapsulation of glucose oxidase in alginate hollow beads to reduce the fermentable sugars in simulated must. *Food Biosci*, 24, 67-72
9. Alonso-Rebollo A, Ramos-Gómez S, Busto MD, **Ortega N** (2017) Development and optimization of an efficient qPCR system for olive authentication in edible oils. *Food Chem*, 232, 827-835.
10. Ramos-Gómez S, Busto MD, Albillos S, Ortega N (2016). Novel qPCR systems for olive (*Olea europaea* L.) authentication in oils and food. *Food Chem*, 194, 4447-454
11. Mvila BG, Pilar-Izquierdo MC, Busto MD, Pérez-Mateos M, **Ortega N** (2015). Synthesis and characterization of a stable humic-urease complex: application to barley seed encapsulation for improving N uptake. *J Sci Food Agric*, 96, 2981-2989
12. Ramos-Gómez S, Busto MD, Pérez-Mateos M, **Ortega N** (2014). Development of a method to recovery and amplification DNA by real-time PCR from commercial vegetable oil. *Food Chem*, 158:374-383

13. Palacios D, Busto MD, **Ortega N** (2014). Study of a new spectrophotometric end-point assay for lipase activity determination in aqueous media. *LWT-Food Sci Technol*, 55: 536-542
14. Pilar-Izquierdo MC, Busto MD, **Ortega N**, Pérez-Mateos M (2013) Barley seeds encapsulated in calcium alginate gels with phosphatase and humate-phosphatase complexes for improving phosphorus bioavailability. *Agronomy J*, 105-6, 1565–1570.
15. Pilar-Izquierdo MC, **Ortega N**, Pérez-Mateos M, Busto MD (2012). Barley seed coating with free and immobilized alkaline phosphatase to improve P uptake and plant growth. *J Agricul Sci*, 150, 691-701.
16. Cavia Saiz M, Muñiz P. **Ortega N**, Busto MD (2011) Effect of enzymatic debittering on antioxidant capacity and protective role against oxidative stress of grapefruit juice in comparison with adsorption on exchange resin. *Food Chem*, 125, 158-163
17. Pilar MC, **Ortega N**, Pérez-Mateos M, Busto MD (2009). Alkaline phosphatase-resorcinol complex: characterization and application to seed coating. *J Agric Food Chem*, 57, 1967-1974
18. Gianfreda L, Sannino F, **Ortega N**, Nannipieri P. (1994). Activity of free and immobilized urease in soil: effect of pesticides. *Soil Biol Biochem*, 26, 777-784.

### C.2. Research project: 2012 to 2022 and related to the requested project

1. BIORemediation systems exploiting SYnergieS for improved removal of Mixed pollutants – (BIOSYSMO). European Research Executive Agency. HORIZON-CL6-2021-ZEROPOLLUTION-01-10. HORIZON-RIA Project number: 101060211. Grant: 4.873.331 €. Type of participation: Researcher (2022-2026)
2. Identification of therapeutic targets for the personalized treatment of cancer patients: From tumor tissue to liquid biopsy (BIOINFO-ONCOTARGET). II Call for Research Projects in Life and Health Sciences-UBU. Funded by the foundation Obras Social “La Caixa” y Fundación Caja Burgos. Grant: € 85,000€ . Type of participation: Researcher (2020-2021).
3. Enzymatic production of structured monoglycerides and diacylglycerides from sunflower oil. bioactive characteristics and oxidative stability. Junta de Castilla y León-Consejería de Educación (Ref. BU040G18). Grant: 12,000 €. Type of participation: Researcher (05/06/2018-30/09/2020).
4. **Degradación de pesticidas y residuos agrícolas por enzimas microbianos inmovilizados**. Caja de Ahorros Municipal de Burgos- CAM. Grant: 3590 €. Type of participation: Researcher (01/03/1990-01/03/1991).
5. **Uso de enzimas estabilizados para acelerar la degradación de pesticidas contaminantes**. Junta de Castilla y León (Ref.601/89). Grant: 25.478,50 €. Type of participation: Researcher. (22/11/1989-22/11/1991).

### C.3. Research contracts

1. Obtaining seeds coated with immobilized enzymes to improve the plant bioavailability of P and N. Grant: € 85,000€ . Company: Agropecuaria Palentina S. Coop. Ltda. (AGROPAL). Financing program for an R + D + i project for Spanish companies at the national level, from the CDTI. Ministries of Economy, Industry and Competitiveness (ref. 00110113/IDI20180559). Grant: 48.890 € + IVA, Principal investigator researcher (01/09/2018 al 31/08/2020).
2. Obtaining protein for food use or with techno-functional and / or bioactive characteristics from by-products of the meat industry. Company: Campofrío Food Group, S.A.U (“Campofrío”) Grant: 125,000 €. Principal investigator researcher (27/11/2017 al 30/05/2019).

### C.4. Experiencia en organización de actividades de I+D.

1. X Congreso Nacional de Ciencia y Tecnología de los Alimentos. Congreso Nacional organizado por la Universidad de León, mayo de 2019. Miembro del Comité Científico.

2. IX Congreso Nacional de Ciencia y Tecnología de los Alimentos. Congreso Nacional organizado por la Universidad Complutense de Madrid, la Universidad Autónoma de Madrid y la Universidad Rey Juan Carlos, mayo de 2017. Miembro del Comité Científico.
3. VIII Congreso Nacional de Ciencia y Tecnología de los Alimentos. Congreso Nacional organizado por la Universidad de Badajoz, abril de 2015. Miembro del Comité Científico.

## **Parte D: OTROS MÉRITOS**

### **D.1. Evaluación de Proyectos y Trabajos de investigación**

- Evaluador de la Agencia Nacional de Evaluación y Prospectiva (ANEP). Secretaría de Estado de Investigación. Ministerio de Ciencia e Innovación.
- Evaluador de las siguientes revistas indexadas en el Journal Citation Report: J Food Sci Agr, Int J Biol Macromolecules, Proc Biochem, Food Tehcnol Biotechnol, J Nanoparticules Res, Prep Biochem Biotechnol, Appl Microbiol Biotechnol, J Enz Engineer, Food Chem, Catal Lett, Biotechnol Progr, Int J Mol Sci.

### **D.2 Participación en grupos/equipos de Investigación desarrollo e innovación.**

- Unidad de Investigación Consolidada de Castilla y León . UIC 357. Abril 2023-actualidad.
- Gurpo de Investigación de Excelencia de la Junta de Castilla y León GR167. 2008-2012.
- Grupo de Investigación Reconocido de la Universidad de Burgos“ Bioquímica y Biotecnología”- GIR-BBT. Febrero 2003 -actualidad.

### **D.3. Profesor Tutor de investigación**

- Tutor-Investigador de Estefanía Ruiz Sánchez, dentro del Programa de Formación mediante Prácticas de investigación financiado por la Junta de Castilla y León – Servicio Público de Empleo de Castilla y León (2010)
- Tutora de la Beca de Beaufray Gilaime Mvila Biabantantou – Beca para la realización de Tesis Doctoral concedida por el Congo. Años 2009, 2010
- Directora de la Beca de David Palacios Santamaría – Beca Predoctoral de la Universidad de Burgos para Personal Investigador en Formación. Año 2008, 2009, 2010

### **D.4. Evaluador de artículos en revistas indexadas en primer tercil del JCR**

- Evaluador desde 2019 hasta la actualidad de las revistas: Applied Microbiology and Biotechnology, Food Bioscience, Food Chemistry, Food Control, Food Technology and Biotechnology, International Journal of Biological, International Journal of Food Science and Technology, Journal of Agricultural and Food Chemistry, Molecules, Foods International Journal of Molecular Sciences, Catalysts, Trends in Food Science and Technology, Biomass Conversion and Biorefinery, Journal of Biological Macromolecules

### **D.4. Cargos Académicos**

- 2012-2014; Junio 2019-febrero 2021: Vicedecana de la Facultad de Ciencias de la Universidad de Burgos.
- 2012-febrero 2021: Coordinadora del Grado en Ciencia y Tecnología de los Alimentos

### **D.5. Pertenencia a asociaciones científicas**

- Miembro de la Sociedad Española de Bioquímica