



MINISTERIO  
DE ECONOMÍA  
Y COMPETITIVIDAD

## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2013

SECRETARÍA DE ESTADO  
DE INVESTIGACIÓN  
DESARROLLO E INNOVACIÓN

SECRETARÍA GENERAL  
DE CIENCIA, TECNOLOGÍA  
E INNOVACIÓN

DIRECCIÓN GENERAL  
DE INVESTIGACIÓN  
CIENTÍFICA Y TÉCNICA

SUBDIRECCIÓN GENERAL  
DE RECURSOS HUMANOS  
PARA LA INVESTIGACIÓN

**Nombre:** AZQUETA OSCOZ, AMAYA  
**Referencia:** RYC-2013-14370  
**Área Científica:** Ciencia y Tecnología de los Alimentos  
**Correo Electrónico:** amazqueta@unav.es

### Título:

Tecnical development, genotoxicity testing and nutrition

### Resumen de la Memoria:

I started my scientific career in the area of toxicology of the University of Navarra (UN) in 2000 as assistant in preclinical in vivo toxicological studies. After 2 years, I started my PhD about the mechanism of action of different bio-reductive compounds, intended to be chemotherapeutic agents, in vitro and in vivo. During that time I learned the comet assay in the laboratory of Prof. Collins at the University of Oslo. After being awarded my PhD, in 2006, I moved to work with Prof. Collins in the development, validation and improvement of the comet assay, and its use in nutritional studies both in vitro and in humans. We improved its throughput, sensitivity and specificity to detect different types of DNA damage; we reduced the inter-laboratory variation and we worked on the measurement of DNA repair activity in cells and tissues. I applied the technique in nutritional studies both in vitro and in human with the aim to detect compounds, food or diets that protect genome stability (e.g. phytochemicals). We also measured the effect of the diet on the phenotypic DNA repair capacity of the volunteers, an unexplored area. In 2011 I was back in the toxicology group of UN and since then I have continued working on the improvement and development of the comet assay as a tool for human biomonitoring and genotoxicity testing. I am taking part in nutritional intervention studies using the comet assay to measure DNA damage and the DNA protection state in lymphocytes from the volunteers; and also performing toxicological studies of food contaminants and novel nanocarriers for oral administration in vitro and in vivo where the comet assay is used as a genotoxicity test. The next step is to include the determination of the DNA repair capacities in both nutritional and toxicological studies of food contaminants.

### Resumen del Currículum Vitae:

I studied biology in the University of Navarra (UN) from 1995-1999. From 2000, with a 3 year grant (Gov. of Navarra) for practical training in the Research Center in Applied Pharmacobiology (CIFA) of UN, I was involved in preclinical in vivo toxicological studies carried out under GLP. Afterwards I got a grant (UN) to carry out PhD studies in the Toxicology Group. My objective was to identify new molecules that exert selective activity in the hypoxic core of solid tumors and to study their mechanism of action. I learnt in vitro toxicology assays and became very interested in genotoxicity. To learn new techniques, I got mobility grants and spent time at the Universities of Bordeaux 2-Victor Ségalen, Barcelona, Monastir and Oslo (UiO). During my PhD I collaborated in 2 European projects and a cooperation project with Tunisia and also coordinated preclinical studies carried out in CIFA. In May 2006 I was awarded my PhD in Biology (European certification in Aug. 2006).

In Oct. 2006 I received a postdoctoral grant (Research Council of Norway) to spend 3 months in the Nutrition Department at UiO. From 2007-2010 I was employed at UiO on 2 EC FP6 projects: COMICS, developing and validating the comet assay to measure DNA lesions and repair; and NewGeneris, relating maternal nutrition to effects in newborns (measuring DNA damage and repair in lymphocytes). We also used the comet assay to measure antioxidant properties of phytochemicals. Innovative work included measuring DNA lesions in human tissues (prostate, lens, cornea). I coordinated a substantial part of the work in the research group.

In 2009, after COMICS success, I was co-founder of a spin-off company, Comet Biotech. I am also a party to 3 inventor's ownership agreements with UiO.

In Dec. 2010 I joined the Dep.t of Food Sciences, Physiology and Toxicology of UN with a research contract from the Juan de la Cierva program (Gov.t of Spain). I continued working in collaboration with UiO on improvement and validation of the comet assay to measure different DNA lesions and DNA repair capacity in different matrices (cell lines, lymphocytes and tissues), and in projects on nutrition, mycotoxins and nanotoxicology (Alexander, EC FP7). In 2010 I spent 4 months at the National Autonomous University of Mexico (UNAM).

I am guest associate chief editor of a special issue on the comet assay for the Frontiers in Genetics. I am also taking part in the Halifax project, from the non-profit organization Getting to know Cancer, where 18 scientists from 9 countries are studying the influence of environmental chemical exposure on genome stability. I am also organizing the next Spanish Environmental Mutagenesis meeting in Pamplona.

Since I started my PhD I have been involved in teaching at bachelor and master level in UN, UiO, UB, UNAM. Last summer I organized, with colleagues from different countries, a comet assay course in the University of Aveiro. I have supervised 5 undergraduate students (UN), 6 master projects (UN and UiO) and 2 PhD (in progress).



MINISTERIO  
DE ECONOMÍA  
Y COMPETITIVIDAD

## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2013

SECRETARÍA DE ESTADO  
DE INVESTIGACIÓN  
DESARROLLO E INNOVACIÓN

SECRETARÍA GENERAL  
DE CIENCIA, TECNOLOGÍA  
E INNOVACIÓN

DIRECCIÓN GENERAL  
DE INVESTIGACIÓN  
CIENTÍFICA Y TÉCNICA

SUBDIRECCIÓN GENERAL  
DE RECURSOS HUMANOS  
PARA LA INVESTIGACIÓN

So far, I have published 53 papers (15 as 1st author, 3 as last) in international journals and 8 book chapters (5 as 1st author). I have attended 25 national/international conferences and made 81 presentations. I have reviewed papers for >15 international journals. Thanks to all my experiences, I now enjoy an extensive and well-developed network of contact throughout Europe and America.



MINISTERIO  
DE ECONOMÍA  
Y COMPETITIVIDAD

## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2013

SECRETARÍA DE ESTADO  
DE INVESTIGACIÓN  
DESARROLLO E INNOVACIÓN

SECRETARÍA GENERAL  
DE CIENCIA, TECNOLOGÍA  
E INNOVACIÓN

DIRECCIÓN GENERAL  
DE INVESTIGACIÓN  
CIENTÍFICA Y TÉCNICA

SUBDIRECCIÓN GENERAL  
DE RECURSOS HUMANOS  
PARA LA INVESTIGACIÓN

**Nombre:** CASTRO PUYANA, MARIA  
**Referencia:** RYC-2013-12688  
**Área Científica:** Ciencia y Tecnología de los Alimentos  
**Correo Electrónico:** maria.castro@csic.es

### Título:

Development of advanced analytical methodologies for food analysis to identify and quantify chiral and non chiral biomarkers of food quality, safety and traceability.

### Resumen de la Memoria:

The applicant, both in her pre-doctoral stage and in her different post-doctoral stays, has achieved a great deal of experience in Food Science. To carry out her investigation she has analyzed a broad range of food matrices, such as infant formulas, soybean derived foodstuffs, vegetable oils, different plants, algae, wines and spices. Judging from her research work, she has shown to have sufficient skills and knowledge to address an analytical problem, from sample preparation to data analysis. Thus, she has carried out the development of a high number of analytical methodologies (chiral and non chiral) based on the use of capillary electrophoresis, liquid chromatography, or gas chromatography coupled to different detection modes (UV, fluorescence, phosphorescence, mass spectrometry). She has experience in the use of different extraction procedures combining with statistical tools to optimize the extraction conditions. She also has experience in the characterization and functional analysis (mainly regarding the antioxidant activity) of substances and natural extracts. Moreover, in the last year she has achieved a high knowledge regarding the development of metabolomics approaches to assess food quality, safety and traceability as well as about the bioinformatics tools and processes needed to analyze data.

Her research career can be summarized in the publication of 33 scientific articles in journals included in the SCI, 2 articles in journals not included in the SCI, 7 book chapters in prestigious editorials, and 2 patents. Moreover, she has supervised different research works including a Ph.D. student, a Master Student, a research stay of a foreign Ph.D. student, two Socrates-Erasmus students, and one Bachelor student.

The research lines in which the applicant shows a high competence include: (i) development and application of advanced analytical methodologies (chiral and non chiral) based on the use of capillary electrophoresis, high-performance liquid chromatography and gas chromatography coupled to a high number of detection techniques (UV, fluorescence, phosphorescence, and mass spectrometry) for food analysis (quality, safety and traceability); (ii) development of chiral methodologies to achieve a higher knowledge on the chiral discrimination mechanism to broaden the number of chiral selectors than can be used in the CE-MS coupling; (iii) development and application of green extraction processes to obtain sought compounds from food matrices using experimental designs and chemometric tools for their optimization, and (iv) development of new metabolomic strategies to identify and quantify chiral and non chiral biomarkers of food quality, safety and traceability.

### Resumen del Currículum Vitae:

The candidate, Dr. María Castro Puyana, earned her Bachelor Degree in Chemistry from the University of Alcalá in 2003. She carried out her Ph.D. studies (2004-2007) in the Department of Analytical Chemistry of this University supported by a FPI grant from the UAH under the supervision of Prof. Marina and Dr. Crego. During this period she spent three months in Sepaserve GmbH (Germany) under the supervision of Prof. Chankvetadze. In December 2007 she received the Ph.D. degree (European Doctorate) and her thesis was awarded with the highest qualifications and the Ph.D. Extraordinary Award from the UAH (2007-2008) for her contributions in the field of chiral separations. After defending her thesis she continued working 4 months as a post-doctoral researcher in the same research group and then she moved to the Institute of General Organic Chemistry (CSIC) also as a post-doctoral researcher (7 months). In January 2009, she moved to Amsterdam where she spent 18 months working in the field of analytical chemistry and applied spectroscopy in the group of Prof. Gooiger with a MICINN (Spanish Ministry for Science and Innovation) postdoctoral fellowship. In July 2010 she obtained a Juan de la Cierva contract and joined the group of Prof. Cifuentes in the Institute of Food Science Research (CSIC-UAM). During this period she was in a 5-weeks stay in the Industrial Research Limited of Wellington (New Zealand). Once finished her Juan de la Cierva contract, she joined the Department of Analytical Chemistry from the UAH during 6 months. At that time she was awarded with a fellowship from the German Academic Exchange Service to carry out a 2 months stay in the Helmholtz Zentrum Muenchen under the supervision of Prof. Schimtt-Kopplin, (her collaboration were extended 2 months in which she worked as invited researcher). Since January 2014, she continues working in Helmholtz Zentrum under a 3 months postdoctoral scholarship from the Université de Bourgogne (Collaboration work between both institutions).

Her current research career is focused on the development of advanced analytical methodologies to carry out the analysis of compounds of interest in Food Science. To date, the candidate has published 33 scientific articles in high-impact journals included in the SCI, 2 articles (one under revision) in journals not included in the SCI, and 7 book chapters (one under revision) in prestigious editorials. In addition, she is co-inventor of 2 patents. She has an impact factor average for her articles of 8.19 (JCR 1st February



MINISTERIO  
DE ECONOMÍA  
Y COMPETITIVIDAD

## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2013

SECRETARÍA DE ESTADO  
DE INVESTIGACIÓN  
DESARROLLO E INNOVACIÓN

SECRETARÍA GENERAL  
DE CIENCIA, TECNOLOGÍA  
E INNOVACIÓN

DIRECCIÓN GENERAL  
DE INVESTIGACIÓN  
CIENTÍFICA Y TÉCNICA

SUBDIRECCIÓN GENERAL  
DE RECURSOS HUMANOS  
PARA LA INVESTIGACIÓN

2014) and an h-index of 11. She has participated in 10 research projects (7 national and 3 international). Her research work has been presented (3 invited conferences, 4 oral communications, and 37 poster contributions) in 29 different conferences (21 international and 8 national). She has supervised the research work of a Master student, 2 Socrates-Erasmus students, one research stay of a foreign Ph.D. student, and she also served as mentor of a bachelor student. Currently, she is involved in the supervision of a Ph.D. student. Moreover, the candidate has participated as an invited speaker (teacher) of a Master program from the UAH (2013-current), collaborates as reviewer for 10 SCI journals (J. Chromatogr. A, Electrophoresis, J. Agric. Food Chem, J. Pharm. Biomed. Anal., etc) and she is also accredited as **◆Ayudante Doctor◆** by the ANECA (2010).



MINISTERIO  
DE ECONOMÍA  
Y COMPETITIVIDAD

## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2013

SECRETARÍA DE ESTADO  
DE INVESTIGACIÓN  
DESARROLLO E INNOVACIÓN

SECRETARÍA GENERAL  
DE CIENCIA, TECNOLOGÍA  
E INNOVACIÓN

DIRECCIÓN GENERAL  
DE INVESTIGACIÓN  
CIENTÍFICA Y TÉCNICA

SUBDIRECCIÓN GENERAL  
DE RECURSOS HUMANOS  
PARA LA INVESTIGACIÓN

**Nombre:** PEÑAS POZO, MARIA ELENA  
**Referencia:** RYC-2013-14354  
**Área Científica:** Ciencia y Tecnología de los Alimentos  
**Correo Electrónico:** elenape@ifi.csic.es

### Título:

Optimization of technological processes to improve the quality and safety of foods products

### Resumen de la Memoria:

After obtaining my bachelor's degree in Biology (Complutense University of Madrid) in 2000, I started my scientific career in July 2001, when I got a FPI predoctoral grant to perform my PhD studies at Instituto del Frío. During this period, I performed short stays in two renowned European Institutions: Nizo Food Research (the Netherlands), and University of Milan (Italy). In April 2006, I obtained my PhD degree at Autònoma University (Madrid) by defending the thesis entitled "Proteolysis and antigenicity reduction of dairy and soybean wheys by enzymatic hydrolysis assisted by high hydrostatic pressure". In December 2005 I received a grant funded by Danone Institute to start my postdoctoral period at Instituto del Frío, working on the safety improvement of seed sprouts by innovative technologies, and more concretely, on the enhancement of the microbiological quality and reduction of the antigenicity of these vegetable products by application of high pressure technology in combination with mild temperatures and/or natural antimicrobial compounds. From January 2008 to September 2010 I have developed my research career at Institute of Industrial Fermentations through a Research Project associated contract (3 months) first and after that through a JAE-Doc contract. During this period my research efforts were aimed to the optimization of fermentation processes and storage conditions to produce functional fermented cabbages (sauerkrauts) with enhanced content of glucosinolate breakdown products and improved antioxidant activity. I performed a stay (6 months) in MTT Agrifood Research Institute (Finland) to complete my knowledge in GC/MS analysis of volatile bioactive compounds in sauerkraut. From September 2010 to March 2013 I have conducted my research career at University of Milan, working on the development and immunochemical evaluation of new gluten-free foods, as well as on the evaluation of the antigenicity of several food products. During this period I got the chance to be involved in a Randomized Double Blind Multicentre Human Study aimed to assess the safety of oats for individuals affected by coeliac disease. Since June 2013, my research work, performed at ICTAN, is being focused on the optimization of different processing technologies for obtaining multifunctional ingredients with antioxidant and antihypertensive activities. In summary, my research during my scientific career has been mainly focused on the optimization of technological processes to improve the quality and safety of food products, as well as on the development of new functional ingredients. Through the development of the above mentioned activities, I have acquired a multidisciplinary knowledge and I have gained skills in microbiology, enzymology, proteomics, immunochemistry and management of human and animal studies, which I consider that will allow me to face the challenges of any research project in the area of Food Science and Technology.

### Resumen del Currículum Vitae:

I started my scientific career in July 2001 when I began my PhD studies through a FPI predoctoral grant and during these twelve years I have actively participated in 7 national CICYT funded research projects and two contracts with food companies making important contributions in the area of Food Science and Technology. So far, I have published 43 peer-reviewed papers, 39 of them in journals indexed in the Science Citation Index (SCI) and 25 of them in top ranked journals (first quartile). I am first or second author in 77% of my publications and they have been highly cited giving me an h index of 12. Furthermore I am co-author of 4 book chapters and of a patent recently applied and I have participated with 30 contributions in National and International conferences. Since 2010, I have given more than 40 hours of lectures in BSc courses for students of Pharmacy and Chemical and Toxicological Safety of Environment at the universities of Milan (Italia) and Nostra Signora del Buon Consiglio (Albania) and I have supervised the research work of 8 undergraduate students corresponding to their bachelor's thesis. Since the beginning of my scientific career I have been continuously financed by many competitive programmes to conduct research in Institutions of recognized prestige. I have 3 years of postdoctoral experience in European Research Institutions: 6 months in MTT Agrifood Research Institute (Finland) and 2 years and a half in the Department of Pharmacological Sciences at the University of Milan, as well as two predoctoral short stays, which have given me the opportunity to get to know many research environments and laboratory managing styles and to learn different experimental techniques. Finally, I have collaborated as a reviewer in different international journals in the field of Food Science and Technology.



MINISTERIO  
DE ECONOMÍA  
Y COMPETITIVIDAD

## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2013

SECRETARÍA DE ESTADO  
DE INVESTIGACIÓN  
DESARROLLO E INNOVACIÓN

SECRETARÍA GENERAL  
DE CIENCIA, TECNOLOGÍA  
E INNOVACIÓN

DIRECCIÓN GENERAL  
DE INVESTIGACIÓN  
CIENTÍFICA Y TÉCNICA

SUBDIRECCIÓN GENERAL  
DE RECURSOS HUMANOS  
PARA LA INVESTIGACIÓN

**Nombre:** BOU NOVENSA, RICARD  
**Referencia:** RYC-2013-12745  
**Área Científica:** Ciencia y Tecnología de los Alimentos  
**Correo Electrónico:** ricard\_bou@ictan.csic.es

### Título:

Improvement of food quality by increasing nutritional value and/or reducing undesirable compounds

### Resumen de la Memoria:

There is an increased demand for functional foods, organic, and/or foods with improved nutritional value. However, the development of such foods is not easy because many times entail difficulties and drawbacks that have been addressed in my career. During my PhD at the UB I looked into the enrichment of poultry meat with n-3 polyunsaturated fatty acids by means of animals dietary factors as it is an easy practice which allows us to increase meat and eggs nutritional value. Unfortunately, this strategy and the direct addition of these fatty acids may cause several problems perhaps being the increased susceptibility to oxidation the most important. As for this, it is important to assess different dietary treatments to achieve a healthy meat, accepted by consumers, and, in addition, with longer shelf-life. The stability of these products can be increased by the dietary supplementation with antioxidants. The enrichment with minerals (i.e. Se) and in any other compound of interest by means of animal feeding is also in the scope of this research line.

As a post-doc, my research activity continued with animal feeding and the use of relatively oxidized fats as well as the use of other lipid materials (fatty acids, glycerides) obtained from the industry that are considered co- and by-products. These lipid materials can be used in animal feeding and represent a sustainable practice. However, the use of these lipids is controversial as several oxidation compounds have been reported to have adverse effects on health. Regardless of the origin, the extent of oxidation is crucial in any food product. Therefore, I continued my research at UMass which focused on the methodology to measure oxidation and studying the catalytic effects of heme iron. In my career it is remarkable my expertise in the minimization of lipid oxidation by means of different strategies and in the development of new methods to determine oxidation compounds.

After that, I returned to the UB and advised two PhD students. One PhD thesis dealt with the reduction or elimination of nitrite/nitrate in meat products. Because of the formation of carcinogenic nitrosamines, the reduction of added and residual nitrite is desirable in order to improve the safety of cured meat products. However, in this particular case this risk has to be balanced with that of foodborne intoxication due to Clostridium while maintaining sensory properties and oxidative stability. Also in this frame, the development of label friendly products without allergenic compounds and/or chemical additives is of interest. The other PhD student dealt with the enrichment of bakery products with heme iron. This iron form is highly bioavailable and thus can be used as strategy to tackle iron deficiency. As other iron forms, the main challenge is to minimize its pro-oxidative effect by means of several strategies including the addition of antioxidants and encapsulation.

One year ago I joined to my current institute (ICTAN-CSIC) to study the applicability of multiple emulsions in the development of functional meat products. By means of this technology it is possible to encapsulate hydrosoluble and liposoluble bioactive compounds. In addition, its use as a food ingredient allows the reduction of fat as well as the lipid profile improvement of meat products by means of reformulation processes. By means of this technology and other approaches we pursue to satisfy consumers demand for healthier and functional foods.

### Resumen del Currículum Vitae:

In chronological order, I obtained the Agricultural Engineering degree specializing in Agricultural and Food Industries and the same specializing in Horticulture, Fruticulture and Gardening at the Univ. Politècnica de Catalunya (UPC). Later, I obtained a degree in Food Science and Technology at the Univ. Barcelona (UB). Afterwards, I earned a master degree in Pharmaceutical Sciences at the UB and at that time I met my future PhD advisors. After this master, I started my PhD and I defended my thesis in 2005 which was awarded with the PhD special mention of the UB. As a post-doc, I continued my research activity in various projects of which some of them were in collaboration with the Univ. Autònoma de Barcelona. In 2006, I was awarded a Fulbright postdoctoral fellowship and I went to the Univ. Massachusetts (USA). In 2008, I returned to the UB thanks to a Juan de la Cierva fellowship and continued there until October 2012 when I moved to my current position at the Inst. Ciencia y Tecnología de los Alimentos y Nutrición (ICTAN-CSIC) thanks to a JAE-post fellowship.

So far, I participated in 16 research projects from open competitive calls of which 1 was funded by the 6th Framework Programme and in other I was the PI. I also participated in 11 research projects with private companies of which I was the PI in 4. This activity has resulted in 32 participations in conferences and congresses of which 5 were oral presentations. In addition, I have authored 38 publications in SCI indexed international journals, 1 book chapter and 6 other publications. It is worth to mention that I am the first author, the corresponding or the last author in the majority of these publications. In addition, 3 of these papers were reviews of which I was the first author in 2. Ten of these papers are related with validation and optimization of analytical methods. Research



MINISTERIO  
DE ECONOMÍA  
Y COMPETITIVIDAD

## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2013

SECRETARÍA DE ESTADO  
DE INVESTIGACIÓN  
DESARROLLO E INNOVACIÓN

SECRETARÍA GENERAL  
DE CIENCIA, TECNOLOGÍA  
E INNOVACIÓN

DIRECCIÓN GENERAL  
DE INVESTIGACIÓN  
CIENTÍFICA Y TÉCNICA

SUBDIRECCIÓN GENERAL  
DE RECURSOS HUMANOS  
PARA LA INVESTIGACIÓN

papers involve different food matrices and biological samples. Most of these publications were of high impact and my h-index is 13. In 2004, I was hired as lecturer and at that time and in other periods at the UB I used to complement my research activity with teaching in the following degrees: Nutrition and Dietetics, Pharmacy and in Food Sci. and Technol. I also taught graduate students in the PhD program Health, Foods and Drugs as well as in the master's degrees in Food Development and Innovation, and in Drug, Cosmetics and Food Quality. In the latter master degree I was coordinator of the subject titled Food Processing and Technology. I have supervised 1 master student and 3 PhD students. In 2012, I got my master degree in Higher Education Teaching for Novel Teachers. Related with that, the Catalan (AQU) and the Spanish National (ANECA) agencies for quality assessment and accreditation issued favorable reports as lecturer professor.



MINISTERIO  
DE ECONOMÍA  
Y COMPETITIVIDAD

## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2013

SECRETARÍA DE ESTADO  
DE INVESTIGACIÓN  
DESARROLLO E INNOVACIÓN

SECRETARÍA GENERAL  
DE CIENCIA, TECNOLOGÍA  
E INNOVACIÓN

DIRECCIÓN GENERAL  
DE INVESTIGACIÓN  
CIENTÍFICA Y TÉCNICA

SUBDIRECCIÓN GENERAL  
DE RECURSOS HUMANOS  
PARA LA INVESTIGACIÓN

**Nombre:** RODRIGUEZ DIAZ, JESUS  
**Referencia:** RYC-2013-12442  
**Área Científica:** Ciencia y Tecnología de los Alimentos  
**Correo Electrónico:** jrodriguezbio@gmail.com

### Título:

Lactic Acid Bacteria to Counteract Viral Gastroenteritis

### Resumen de la Memoria:

Lactic acid bacteria (LAB) are microorganisms present in numerous food fermentations and are also normal constituents of the microbiota of the intestinal tract. They have attracted great interest in the field of functional foods because some LAB strains are probiotics, for which many health claims have been reported, including protection against intestinal pathogens and immunomodulation. In the main research line carried out by the applicant, different approaches have been utilized to study the ability of LAB to counteract viral gastroenteritis produced by norovirus (Caliciviridae) and rotavirus, the two major causal agents of food- and water-borne nonbacterial gastroenteritis.

The applicant has carried out extensive studies on several aspects of the pathophysiology, immunology and epidemiology of rotaviruses. He participated in the development of recombinant strains of probiotic LAB expressing rotaviral antigens and antibodies. In this approach LAB were used as oral vehicles for the delivery of active and passive immunity in animal models.

Research of the applicant has also been focused on the genetic susceptibility to norovirus infections, which is related to the ability of noroviruses to bind oligosaccharides of the histo-blood group antigens (HBGAs) present in human secretions like human milk and in the intestinal mucosa. A new approach was developed by the applicant in which LAB were utilized as cellular factories to overproduce activated sugars such UDP-glucose, UDP-galactose and UDP-N-acetylglucosamine to be used as precursors for the biotechnological synthesis of human milk oligosaccharides. In this context, the ability of alpha-L-fucosidase enzymes from LAB to hydrolyse and synthesise oligosaccharides containing fucose, which are a main component of human milk oligosaccharides and HBGAs, was studied and applied to the production of different fucosyl-oligosaccharides. These compounds have been analysed for their potential as prebiotics and are being tested as possible anti-adhesins for noroviruses and bacterial intestinal pathogens that bind HBGAs. This research opens up the opportunity to use human milk-like oligosaccharides with biological activity in the development of new functional foods.

Another aspect of the relationship probiotics/intestinal viruses in which the applicant is also involved is related to the mechanisms by which probiotics protect against viral infections. The interaction of probiotic and non-probiotic bacterial strains with noroviruses was assessed through the development of a model that utilizes subviral P-particles derived from the viral capsid. By using this model it has been proven that noroviruses differentially bind to LAB. In addition, some LAB have the capacity to interfere with norovirus attachment to intestinal host cells by either reducing or enhancing virus binding. This model serves as a first evaluation test for probiotics selection and in the study of the mechanisms/components involved in probiotics-noroviruses interaction.

### Resumen del Currículum Vitae:

Jesús Rodríguez Díaz earned the Biology degree at the University of Valencia in 2000, obtaining one of the highest qualifications of this year. During three years (1998-2000) he collaborated in research tasks and he was recipient of a **Beca de Colaboración** from the Spanish Ministry of Education at the Department of Microbiology, University of Valencia.

The PhD (2001-2005) studies were developed both at the Department of Microbiology, University of Valencia and at the Division of Molecular Virology, University of Linköping (Sweden) through a FPU grant from the Spanish Ministry of Education. He obtained the higher qualification (**Sobresaliente Cum Laude**) and the **European Mention**.

The candidate has performed his Postdoctoral career in several research centers including: Centro de Investigación Príncipe Felipe (CIPF, Valencia, Spain; 2006 and 2008-2009), Instituto Venezolano de Investigaciones Científicas (IVIC, Caracas, Venezuela; 2007-2008), and Instituto de Agroquímica y Tecnología de Alimentos (IATA-CSIC, Valencia, Spain; 2009-2012). During his stays at the University of Valencia, the University of Linköping and the IVIC he has mainly specialized in the molecular biology of food and waterborne viruses causing human gastroenteritis. At IATA he has developed a research line aimed to use probiotics to counteract viral gastroenteritis. Dr Rodríguez-Díaz has also worked as scientific manager and research biologist in two companies devoted to the development of cutting edge technologies for their applications in the biosensors field. Biosensores, S.L. (2007) and Das Photonics, S.L. (2012-2013).

The productivity of the candidate includes 47 publications, 36 of them are research articles in SCI-indexed journals, being first author in thirteen of them, second author in seven and corresponding author in three. The average impact factor of the publications is 3.371. The average number of citations of candidate's publications is 14.16 with an h index of 11 (Researcher ID B-2091-2012). The candidate has also published three articles in non-SCI journals, one book and seven book chapters. Besides the scientific publications,





MINISTERIO  
DE ECONOMÍA  
Y COMPETITIVIDAD

## AYUDAS RAMÓN Y CAJAL CONVOCATORIA 2013









SECRETARÍA DE ESTADO  
DE INVESTIGACIÓN  
DESARROLLO E INNOVACIÓN

SECRETARÍA GENERAL  
DE CIENCIA, TECNOLOGÍA  
E INNOVACIÓN

DIRECCIÓN GENERAL  
DE INVESTIGACIÓN  
CIENTÍFICA Y TÉCNICA

SUBDIRECCIÓN GENERAL  
DE RECURSOS HUMANOS  
PARA LA INVESTIGACIÓN

the candidate has presented 49 communications at national and international meetings. He has participated in 16 national and international research projects including six European projects. The candidate has been the principal researcher in three projects and in two contracts with private companies. As principal researcher, Dr Rodríguez-Díaz got experience in managing of projects, including the writing of proposals and reports, hiring and supervision of technical personnel and corresponding of articles.

The candidate has also participated in university teaching activities. He has supervised six master students at the Faculty of Medical Sciences at Linköping University and at the University of Valencia. As well, at the Centro de Estudios Avanzados (CEA, IVIC, Venezuela) he has participated in the teaching of five modules of the Microbiology PhD Program. At present, he is co-supervising three PhD students, two from the University of Valencia and one from the Polytechnic University of Valencia. Dr Rodríguez-Díaz has recently obtained the National Accreditation as Profesor de Universidad Privada, Contratado Doctor and Ayudante Doctor from the Spanish Evaluation and Accreditation Agency (ANECA).