AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2013

Nombre: **GONZALEZ CABRERA, JOEL**
Referencia: RYC-2013-13834
Área Científica: Agricultura
Correo Electrónico: joel.guajiro123@gmail.com

Título:

Study of resistance mechanisms to pesticides and implementation of integrated pest management

Resumen de la Memoria:

Title: Study of resistance mechanisms to pesticides and implementation of integrated pest management.
Insect pests are a profound threat to agricultural production, causing both direct feeding damage and transmitting important plant diseases. Without pest control, yield losses are typically around 20% and can be considerably higher depending on the crop/pest. Currently, Integrated Pest Management (IPM) is promoted as the most effective and environmentally sensitive approach to combatting insect pests, integrating cultural practices and the sensible use of chemical and biological control measures.
In this direction, the analysis of the mechanisms underlying the evolution of resistance to pesticides in insect populations should be at the forefront of the research in agriculture to prevent, if possible, that this phenomenon goes out of control shortening the efficacy of this cost-effective technology. My expertise should be of great interest to accomplish studies dealing with the characterization of the resistance evolved to biological as well as chemical pesticides (see below). The key steps (toxicological, genetic and biochemical analyses) and methodology are very similar in all cases, although major differences can be found at the biochemical level as it depends on the pesticide mode of action and there are important variations for each family of active ingredient. My expertise in this field is especially suitable to lead research efforts aiming to elucidate the mechanisms of resistance to pesticides and to recommend the best management strategy to maintain the pest under the economic threshold.
On the other hand, my extensive experience with the Bacillus thuringiensis-based technology together with the expertise on biological control methods and Integrated Pest Management at Instituto Valenciano de Investigaciones Agrarias (IVIA) is an excellent framework to deal either with ‘native’ pests lacking effective control as well as with those newly introduced or considered as quarantine pests. For example: This was the case of Tuta absoluta (Meyrick) (Lepidoptera: Gelechiidae), a ‘key pest’ of tomato, and other solanaceae plants. As part of the efforts from several funding agencies, we identified the most active Bt-based formulates against T. absoluta and we designed a combined strategy (tested in laboratory but also in semi-field and field trials) using also mirid predators that resulted successful in controlling the pest with zero pesticide residues in the fruit.
Based on my solid expertise in genetics, biochemistry and entomology, I am well positioned to lead a long-term research line focussed on addressing local as well as global challenges in the area of pest control promoting food quality and safety.

Resumen del Currículum Vitae:

SITUACIÓN PROFESIONAL ACTUAL
Investigador Post-doctoral
Rothamsted Research. Harpenden (Reino Unido)
Becas/Contratos: Marie Curie intra-european fellowship for experienced researcher
01/09/2012‘presente
Mecanismo de acción y selectividad de los piretroides en ácaros y garrapatas de interés económico

EXPERIENCIA PROFESIONAL PREVIA
Investigador Post-doctoral
Centro de Investigaciones Biológicas. Madrid (España)
Becas/Contratos: Titulado superior y JAEdoc
01/10/2009‘31/08/2012
Caracterización bioquímica del mecanismo de resistencia a Bacillus thuringiensis en Mythimna unipuncta
Análisis bioquímico y proteómico de la fisiología digestiva en ácaros

Investigador Post-doctoral
Instituto Valenciano de Investigaciones Agrarias, Valencia (España)
Becas/Contratos: Juan de la Cierva, Titulado superior
01/02/2006‘30/09/2009
Búsqueda de cepas de Bacillus thuringiensis efectivas para el control de la mosca mediterránea de la fruta y del picudo rojo de las palmeras
Control biológico de Tuta absoluta con Bacillus thuringiensis

Investigador Pre y Post-doctoral
Departamento de Genética. Universidad de Valencia (España)
Becas/Contratos: Beca AECI, Beca Universidad de Valencia, 2 contratos de técnico medio de investigación.
13/11/98 31/12/2005
Caracterización genética y bioquímica de la resistencia a Bacillus thuringiensis en plagas de interés económico
Caracterización y evaluación de cepas de Bacillus thuringiensis para el desarrollo de nuevos bioinsecticidas

Investigador de plantilla
Centro de Ingeniería Genética y Biotecnología. Ciudad de la Habana (Cuba)
01/09/96 12/11/98
Clonación, modificación y caracterización de genes cry a partir de cepas salvajes de Bacillus thuringiensis.
Obtención de plantas transgénicas de col que expresan las proteínas Cry de Bacillus thuringiensis
Estudio de la expresión transitoria de genes en protoplastos
Estudio de la interacción de las proteínas Cry con el intestino de ratón

EDUCACIÓN Y FORMACIÓN
Doctorado por la Universidad de Valencia
03/10/2000 30/01/2004
Departamento de Genética. Universidad de Valencia (España)
Tesis: Respuesta de tres especies de lepidópteros a las proteínas Cry de Bacillus thuringiensis: Análisis genético y bioquímico. Sobresaliente "Cum Laude". Premio extraordinario de doctorado. 2005

Licenciatura en Bioquímica
02/09/1991 10/07/1996
Univ. Habana (Cuba)
Nota general: 4.88 sobre 5. Premio diploma de Oro de mi graduación
Tesina: "Obtención de plantas transgénicas de col con posible resistencia al ataque de Plutella xylostella"

ACTIVIDAD CIENTÍFICA Y TECNOLÓGICA
Participación en proyectos de Investigación: 15. Investigador principal: 4
Publicaciones: 27 artículos en revistas indexadas (JCR). Citas: 431 (h=13). 13 artículos en revistas técnicas. 4 capítulos de libro
Patentes: 2. Una en explotación
Congresos: 42 comunicaciones, 25 internacionales. Conferenciante invitado en 2 ocasiones
Tesis dirigidas: 1 tesis doctoral y 1 de máster
Tutor de estudiantes en prácticas formativas externas en 4 ocasiones (IVIA)
Miembro de la red STEMNET (Reino Unido)
Profesor asociado. Univ. Valencia. 107 horas
Revisor de varias revistas científicas
Vocal o secretario en 5 tribunales de tesis doctoral
Evaluador ANEP proyectos del área de Agricultura, Plan Nacional de I+D+i
Asesor científico en el Panel Environment, Agriculture and Food sciences, programa Researchers Link Bristish Council (Reino Unido)

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Nombre: **MOREIRA TOME, XOAQUIN**
Referencia: RYC-2013-13230
Área Científica: Agricultura
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Título:

Defensive strategies and life-history trade-offs in pine trees

Resumen de la Memoria:

During the PhD at Forestry Research Centre of Lourizan (Spain), I studied genetic variation and environmental modulation of constitutive and induced defences and fundamental constraints and trade-offs in defensive traits amongst pine trees. Results from my PhD showed that soil nutrient availability and genetic variation have large and relevant effects on constitutive and induced defences and on the expression of fitness costs associated with those defences. I completed my PhD thesis in 2010 (University of Vigo) with the highest qualification and publishing seven peer-reviewed papers in top journals of Plant Sciences, Forestry and Ecology areas. Moreover, my PhD dissertation was awarded by the Spanish Society of Forest Science, by the University of Vigo and by the Regional Government of Pontevedra. My postdoctoral studies were aimed at investigating the ecological consequences of plant inter- and intra-specific diversity for plant performance, the structure of associated aboveground arthropod communities and antiherbivore defences in some forestry species. These studies showed that plant diversity (among- and within-species) strongly influenced plant growth and the associated arthropod community at several trophic levels. Simultaneous with this work, I studied the influence of multiple biotic and abiotic factors for the ecology and evolution of masting in pine trees. I found that masting behavior in pine trees evolves as a response to both pollen limitation and seed predation. Finally, I also aimed to study the effect of predators on patterns of allocation to plant defences both among tissues within individual plants, as well as across populations found along a latitudinal gradient in the Yucatan Peninsula (Mexico) and Belize. I got independent funding to carry out all of my postdoctoral studies, publishing five peer-reviewed papers in top journals in these two postdoc years. The main goal for my near future would be to start a new research line in a gap of knowledge. This future work will aim to understand what biotic or abiotic factors promote or constraint the expression of pine chemical defences against herbivores into ecological gradients.

Resumen del Currículum Vitae:

I started my scientific career in 2006 when I got two PhD fellowships from the Regional Government of Galicia and the Spanish Commission of Science and Technology under the supervision of Dr. Luis Sampedro and Dr. Rafael Zas at the Forestry Research Center of Lourizan and Biological Mission of Galicia-CSIC, respectively. The main goal of my PhD was to study the genetics and environmental modulations of constitutive and induced defences in pine trees. I completed my PhD thesis in 2010 (University of Vigo) with the highest qualification and publishing seven peer-reviewed papers in top journals of Plant Sciences, Forestry and Ecology areas. My PhD dissertation was awarded by the Spanish Society of Forest Science, by the University of Vigo and by the Regional Government of Pontevedra. After finishing my PhD I obtained a Fulbright Postdoctoral Fellowship to join Dr. Kailen Mooney's Lab at University of California-Irvine (USA). The aim of my postdoc period was to study the consequences of plant intra- and inter-specific diversity on plant performance and the structure of associated aboveground arthropod communities (using pine trees and the long-lived shrub Baccharis salicifolia). Although I completed my two-year postdoc position only one month ago, this work at UC-Irvine has already resulted in five publications in the very top journals for my field and three more under review now. In total (over my career) I have published 23 peer-reviewed papers (16 as first author), three non peer-reviewed papers and a book chapter. Twenty-two of my peer-reviewed publications (95%) have been published in journals ranked within the first quartile and eight of these twenty-two (36%) within the first decile (e.g. Ecology Letters, Journal of Ecology, Proceedings of the Royal Society B, Journal of Experimental Botany, Forest Ecology and Management). The average impact factor of all my publications is 4.00 and my h index is 8. In terms of research funding, I was successful in getting independent support to carry out all of my postdoctoral studies. I received a research grant from the Spanish Association of Terrestrial Ecology (supporting a study recently published in the Proceedings of the Royal Society B) and two international grants funded jointly by the University of California and CONACyT in Mexico (the UCMEXUS program). Overall, I have been involved in 10 research projects and as the Principal Investigator for three of these, two of which were internationally funded. I have also performed some long- and short-term research stays in high-quality international (USA, Mexico, Canada and Sweden) and national institutions. All these research stays have finished in at least a peer-reviewed paper published. Finally, I have supervised four undergraduate projects (Forestry Engineering at University of Santiago), mentored five undergraduates at UC-Irvine and served as a Reviewer for some of the most influential journals in Plant Sciences, Ecology and Forestry (e.g. Journal of Ecology, Ecology, New Phytologist, Forest Ecology and Management, Oecologia).

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Nombre: **RUBIO ANGULO, MANUEL**
Referencia: RYC-2013-12563
Área Científica: Agricultura
Correo Electrónico: mrubio@cebas.csic.es

Título:

Resistencia a virus en frutales del genero Prunus

Resumen de la Memoria:

La carrera investigadora del solicitante, Manuel Rubio Angulo, ha estado siempre ligada a la mejora de frutales de hueso (Prunus) para la resistencia a enfermedades virales. La sharka, causada por el Plum pox virus (PPV), es una enfermedad de gran importancia económica a nivel nacional y mundial. Los daños producidos por esta enfermedad en los últimos 30 años superan los 10.000 millones de euros, de ahí la necesidad de obtener nuevas variedades resistentes adaptadas a cada zona de cultivo.

Así, durante su etapa Pre-Doctoral el solicitante se centró en la optimización del fenotipado para la resistencia en frutales, aspecto clave para los posteriores estudios genéticos y moleculares. Sus resultados permiten actualmente al investigador evaluar una mayor cantidad de material vegetal (genitores y descendientes) de una manera más eficiente. Esta metodología ha sido posteriormente aplicada con éxito a otras importantes enfermedades de Prunus como Apple chlorotic leaf spot virus (ACLSV) y Hop stunt viroid (HSVd).

Por otro lado, el solicitante ha trabajado en una doble aproximación genética y genómica de la resistencia a PPV en Prunus. Así, ha participado en el desarrollo de dos mapas de ligamiento genético de albaricoquero y melocotonero, donde se han identificado diferentes regiones del genoma asociadas a la resistencia. Además, ha aplicado con éxito la selección asistida mediante marcadores moleculares para la resistencia a potyvirus, tanto en su línea de investigación principal (PPV), como en otros trabajos desarrollados durante su estancia Post-Doctoral en el INRA de Aviñón.

Tras su estancia postdoctoral, se reincorporó al CEBAS con un contrato Jae-Doc del CSIC, aplicando nuevas técnicas moleculares a los estudios de resistencia en frutales y continuando con los estudios de la resistencia a PPV a nivel genético y genómico. Además, el solicitante ha incorporado nuevos enfoques transcriptómicos para profundizar en el análisis de la expresión génica de la resistencia a PPV mediante secuenciación masiva del transcriptoma (RNA-Seq), estudiando la expresión diferencial en melocotonero y albaricoquero.

Por otro lado, el solicitante ha descubierto la posibilidad de transferir la resistencia a PPV del almendro Garrigues al melocotonero, mediante injerto. Dada la ausencia de resistencia a PPV en melocotonero, estos resultados son de una gran importancia, ya que la injerta de la variedad de almendro "Garrigues" podría ser usada como "vacuna" en el melocotonero.

Fruto del trabajo desarrollado, y como responsable de la resistencia a sharka dentro del programa de mejora de albaricoquero del CEBAS, el solicitante es obtentor de tres nuevas variedades: "Rosa", "Mirlo Blanco" y "Mirlo Anaranjado". Estas variedades son la base de la reconversión varietal que se está llevando a cabo en las zonas productoras nacionales afectadas por esta enfermedad, debido principalmente a su resistencia a sharka, su precocidad y su gran calidad gustativa, habiendo sido plantados hasta la fecha más de 400.000 árboles y más de 950 contratos de explotación firmados por agricultores y productores, que han supuesto al CSIC ingresos cercanos a los 500.000 € en concepto de regalías.

Resumen del Currículum Vitae:

El solicitante, Manuel Rubio Angulo, es Ingeniero Técnico Agrícola por la Universidad Politécnica de Valencia (1997), Ingeniero Agrónomo (2000) y Doctor (2006) por la Universidad Miguel Hernández. En el periodo 1999-2002 estuvo contratado a cargo de un proyecto europeo sobre resistencia a sharka, en el Departamento de Mejora del CEBAS de Murcia. Desde julio de 2002 a junio de 2006 disfrutó de una beca FPI, desarrollando su Tesis Doctoral titulada "Resistencia a la sharka en especies frutales del género Prunus" dentro del Programa de Mejora del Albaricoquero del CEBAS. Posteriormente, obtuvo una beca Postdoctoral del MEC para trabajar en el INRA de Aviñón (Francia). Durante la estancia postdoctoral profundizó en diversos aspectos moleculares de la resistencia a Potyvirus. En abril de 2009 obtuvo un contrato JAE-Doc del CSIC, reincorporándose al Departamento de Mejora Genética del CEBAS para continuar sus estudios sobre la resistencia a enfermedades de Prunus, a nivel genético y genómico. Posteriormente, el solicitante continúo con un contrato a cargo del proyecto AGL2010-16335 sobre el análisis transcriptómico de la resistencia a PPV, analizando la expresión génica de la resistencia mediante RNA-Seq. Actualmente, trabaja en la transferencia de la resistencia a PPV mediante injerto de almendro sobre melocotonero.

Además, ha colaborado con el equipo del Dr. Hernández, abriendo una línea de investigación sobre el estudio del metabolismo antioxidativo frente a PPV en Prunus.

A continuación se presentan los méritos del candidato agrupados según los criterios de evaluación de la convocatoria.

A. Méritos curriculares:

- Aportaciones: 76 artículos publicados en revistas científicas (de las cuales destacan 35 publicaciones incluidas en el SCI), tres patentes licenciadas y 50 trabajos presentados en congresos.

- Actividad Internacional: el candidato ha participado en la organización de dos congresos internacionales (ISHS) y en cinco proyectos europeos. Además, ha colaborado con las Universidades de Guelph (Canada), Davis (California, EEUU), El Manar (Túnez), Mendel (República Checa) y Chile, y con los centros de investigación del INRA de Burdeos y Aviñón (Francia).
- Otros Méritos Curriculares: ha participado como profesor en seis Cursos de Postgrado o Máster de la Universidad de Murcia y publicado siete artículos de divulgación.

B. Capacidad de liderazgo:
El solicitante ha sido Tutor de dos investigadores en formación, director de dos Tesis Doctorales (la segunda en ejecución), y de dos Tesis de Licenciatura. Respecto a la movilidad internacional, ha disfrutado de 32 meses en estancias en centros de investigación internacionales. Entre las publicaciones incluidas en la Web of Science con índice de impacto, figura como autor principal (primero o último) en 20 artículos, siendo uno de los tres autores con mayor número de publicaciones sobre la enfermedad de la "sharka" en las bases de datos Scopus y WOS. Sus artículos han sido citados más de 350 veces con un índice H=9. Finalmente, debemos destacar que ha participado en 24 proyectos de investigación y es obtentor de tres variedades de albaricoquero resistentes a sharka (Rosa, Mirlo Blanco y Mirlo Anaranjado), que han tenido un éxito enorme entre el sector productivo con más de 400.000 árboles plantados y 950 contratos de explotación firmados por viveristas y productores con el CSIC.

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Nombre: **PEÑA BARRAGAN, JOSE MANUEL**
Referencia: RYC-2013-14874
Área Científica: Agricultura
Correo Electrónico: jmpena@ias.csic.es

Título:

Applications of new technologies and precision agriculture techniques for an efficient and sustainable crop management

Resumen de la Memoria:

In 2001 I started my research career in the Institute for Sustainable Agriculture (IAS, CSIC) in Cordoba, where I did my PhD research focused in the application of remote sensing technology for monitoring major growing in Andalusia. Then, I was awarded a MEC-Fulbright Postdoc Fellowship to do a 2-years postdoctoral stay in the Department of Plant Sciences of the University of California, Davis. In the UC Davis, I mainly participated in a project about integrating remote sensing and modeling to assess temporal and spatial variability of greenhouse gas emissions. Currently, I am developing my own research-line in the IAS-CSIC based on exploiting the potential of the new generation of remote platforms known as unmanned aerial vehicles (UAV), as well as new remote sensors and innovative object-based image analysis methods for precision agriculture applications, aiming to propose new strategies to optimize the application of inputs in herbaceous and woody crops. My main advances have been in the area of site-specific weed management, in which I am investigating the whole procedure to generate precise weed maps in major crops such as wheat, maize and sunflower. These maps are being currently implemented in herbicide spraying machinery designed for a site-specific weeding treatment in collaboration with two private companies. The novelty of my current investigation is that I am creating these weed maps in the seedling growth stage (early-season), just the stage recommended to apply the weeding treatment into the crop-field. This achievement has not been possible before with conventional airborne or satellite imagery due to their lack of the spatial resolution needed to discriminate the small crop and weed seedlings in early-season. Moreover, the UAVs can work on demand with great flexibility in any moment, which drastically increases its applications to numerous agronomic goals. In this sense, I am also applying this technology to monitor different woody crops, such as intensive olive plantation, poplar plantations, and vineyards.

To support my investigations, in 2011 I obtained economical support from the 7th Framework Programme (7FP) to carry out the 4-year European Project "New remote sensing technologies for optimizing herbicide applications in weed-crop systems (TOAS)", in which I am the Principal Investigator. In addition, I am in charge of the development of the work-package "Perception Systems", as a researcher of another European Project titled "Robot fleets for highly effective agriculture and forestry management (RHEA)", supported also by the 7FP. In this project, I am also testing my results on weed mapping in precise spraying machinery provided by an international company of agricultural machinery. Recently, I also started my participation in the project RECUPERA 2020, in which I will be responsible of two objectives out of the five ones that structure this project. I will participate as a consult in the construction of a new unmanned aerial system (UAS) designed for monitoring agricultural exploitations at large scale, and I will responsible of testing the new technological products derived from the UAS in collaboration with the project¿s partner AgroSAP (company on precision agriculture services). This project will also involve a high component of knowledge and technological transfer to the agricultural sector of Andalusia.

Resumen del Currículum Vitae:

MS in Agricultural Engineering and Doctoral degree (January 2006) from the University of Cordoba. I am currently the Principal Investigator of a 4-year European Project and contract researcher in another Large-scale European Project with 17 partners of 8 countries, both projects financed by the 7th Framework Programme. My advances in these two up-to-date projects have already been published in several high-impact journals and have received much attention in the media. In total, I have participated in 16 research projects (6 International and 10 National). I have supervised various PhD students and I am the co-director of three Doctoral Theses, one presented in 2011 and other two ones currently in progress in IAS-CSIC and in IRSTEA (Montpellier). I have done two international stays in the University of California, Davis (post-doc MEC-Fulbright) and in UC Berkeley (visiting researcher), which produced several papers published in prestigious Q-1 journals (e.g., Remote Sensing of Environment, #1 in remote sensing). I am associate editor of the Spanish Journal of Agricultural Research, and I have been invited as chairman in two international conferences and as speaker in weekly seminars of UC Davis and UC Berkeley. To date, my scientific activity has led to 31 papers (plus 3 under review) published in SCI journals (26 in Q-1 and 4 in Q-2), 7 papers published in non-SCI journals, 5 book chapters, and 64 contributions to national and international congresses. I am also co-author of 7 patents and 5 registered computer software that are included in a whole technological offer.

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Nombre: **CREVILLEN LOMAS, PEDRO**
Referencia: RYC-2013-14689
Área Científica: Agricultura
Correo Electrónico: crevillen.pedro@inia.es

Título:

Control del tiempo de floración

Resumen de la Memoria:

Durante los últimos años, me he centrado en el estudio de la regulación del tiempo de floración. La floración es un proceso crítico para el rendimiento de muchos cultivos: Mi principal interés ha sido el estudio de la vernalización: la aceleración del tiempo de floración en respuesta a periodos prolongados de frío, así como el control genético de la floración. Además de un proceso un proceso biológico de gran interés agronómico, la vernalización es un paradigma de la epigenética en plantas. La epigenética, el estudio de cambios heredables en la función génica que se producen sin un cambio en la secuencia del DNA, es un tema de gran importancia en la actualidad. Muchas de las variaciones fenotípicas que observamos en las especies vegetales en respuesta a cambios en el medio ambiente tienen una base epigenética.

Muchos cultivos de interés agronómico como el trigo, la cebada o las Brassicas tienen variedades que presentan un requerimiento de vernalización. Retrasos o aceleraciones en el tiempo de floración así como alteraciones en la respuesta a la vernalización de muchos cultivos no han sido evaluados de forma exhaustiva y los procesos reguladores que los controlan son muy poco conocidos. La mejora de la productividad de los cultivos para optimizar su adaptación a un medio ambiente cada día más cambiante requiere del conocimiento detallado de las bases moleculares y genéticas de estos mecanismos reguladores. Mi línea de trabajo profundizará en el estudio de dichos mecanismos reguladores del tiempo de floración en Brassicas de interés agronómico.

Resumen del Currículum Vitae:

Licenciatura en Ciencias Biológicas (Universidad de Sevilla, 1999). Tesis doctoral becario F.P.I. en el Instituto de Bioquímica Vegetal y Fotosíntesis (Sevilla). Mi tesis doctoral se centró en el estudio de la ADP-glucosa pirofosforilsa, la enzima que cataliza el paso limitante para la biosíntesis del almidón en plantas. Los principales resultados de mi tesis se plasmaron en 3 publicaciones científicas: Crevillén et al. (2003) J Biol Chem; Crevillén et al. (2005) J Biol Chem; y Ventriglia et al. (2007) Plant & Cell Physiol. Participe en 8 congresos incluyendo dos comunicaciones orales (7th International Congress of Molecular Plant Biology 2003, Barcelona; Reunión Nacional de Biología Molecular de Plantas 2004, Málaga). Tras obtener el título de Doctor en Ciencias Biológicas (19/11/2004, Cum Laude) me incorpore al laboratorio de la Profa. Caroline Dean (John Innes Centre, UK) para estudiar mecanismos epigenéticos de regulación de la floración. Mi principal línea de trabajo estuvo relacionada con la vernalización: un proceso biológico de gran interés agronómico, que además es un paradigma de la epigenética en plantas. Trabajé en la caracterización del mutante vrn5 [Greb at al. (2007) Curr Bio]; y en el estudio de los complejos Polycomb específicos de la vernalización [De Lucia*, Crevillén*, et al. (2008) PNAS *igual contribución]. Mis estudios de la regulación del gene FLC por medio de modificaciones de histonas, procesamiento alternativo del RNA y siRNA dieron lugar a publicaciones en revistas de alto impacto: Shindo et al. (2006) Genes & Dev; Swiezewski et al. (2007) PNAS; Liu et al. (2008) Mol Cell; Pien at al. (2008) Plant Cell. He estudiado la conformación de la cromatina del gen FLC, este trabajo pionero en plantas fue publicado en EMBO J (Crevillén et al. 2013).También fui autor y dirigí un proyecto de investigación financiado por la BBSRC para caracterizar la reprogramación epigenética del gen FLC (2009-2012) Obtuve un contrato senior Marie Curie IEF para trabajar en el CBGP (Madrid). Mi proyecto, evaluado como el 6º de las miles de propuestas FP7-PEOPLE-2011-IEF, se centra en el estudio de factores remodeladores de la cromatina que controlan la floración. Además he realizado numerosas comunicaciones orales: Gordon Research Conference, (EEUU, 2007); Chromatin at the nexus of cell division and differentiation (Madrid, 2008); Chromatin Epigenome meeting (Sydney, 2008), II European Workshop on Plant Chromatin (Versailles, 2011); y he sido invitado como ponente: Epigenetics & RNA SYNGENTA meeting (Londres, 2008) y REDDIVEG (Barcelona, 2008). También escribí una importante revisión para Curr Op Plant Bio (Crevillén, Dean 2011) y he revisado numerosos artículos de manera independiente para revistas del área de Plant Science. Como puede observarse en mi CV, mi trayectoria profesional no solo se refleja en el número y calidad de mis publicaciones sino que a lo largo de mi carrera científica he participado en una serie de actividades científicas que prueban mi independencia y capacidad investigadora.

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AYUDAS RAMÓN Y CAJAL
CONVOCATORIA 2013

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Título:

Dinámica y funcionamiento de comunidades de plantas Mediterráneas bajo diferentes escenarios de cambio climático. Aplicaciones para la gestión y conservación de sistemas agroforestales

Resumen de la Memoria:

Understanding the ecological mechanisms and processes that drive dynamics and functioning of plant communities, and predicting the extent to which the alteration of environmental conditions affect these processes remains one of the major challenges in plant ecology research, from both an applied and basic perspective. My research line comprises an integrative study of the main ecological processes driving plant community dynamics in species of forestry or agronomic interest, as well as of the main functional mechanisms developed by these species in response to environmental conditions (such as drought). On the one hand, I have specialized in recruitment dynamics and characterization of regeneration niches in Mediterranean woody plant species. I have carried out multi-stage demographic studies to identify which factors determine the probability of successful recruitment of coexisting species through ontogeny (seed production, seed dispersal, seedling establishment, etc.). I have used this information to develop mechanistical models based on maximum likelihood estimators, which incorporate the probability of success of subsequent life-history stages as a function of particular environmental conditions. These models can be also applied in restoration and management plans since they constitute a valuable information on the most favourable conditions where each species regenerate. On the other hand, I have acquired a solid background in functional ecology of Mediterranean plant communities with the aim of: (i) understanding the functional mechanisms exhibited by co-occurring species to persist under certain environmental conditions; and (ii) inferring several ecosystem properties of ecological and agricultural importance (such as net primary productivity) under different scenarios of climate change. This functional approach can be also used to develop process-based models, which could be applied to predict species-specific probabilities of success in restoration and management practices by using measurements of key functional traits. Therefore, my research line provides not only a relevant theoretical information on dynamics and functioning of Mediterranean ecosystems but also an applied knowledge for a better management and conservation of these systems under different climate change scenarios.

Resumen del Currículum Vitae:

SCIENTIFIC PRODUCTION

My research work has generated 49 papers in scientific journals, 25 of them included in the Science Citation Index (SCI). These 25 SCI-papers have been published in some of the most influential journals within their discipline fields such as New Phytol., J.Ecology, Ecology, Plos One or FORECO. Of these 25 SCI-papers, 21 (84%) are included within first quartile and 11 within first decile. I am the first author of 13 SCI-papers (12 of 1st Quartile and 8 of 1st Decile). In addition, I have 5 book chapters and other 19 publications in non-indexed journals. Despite the early-life of my publications, I have received over 570 citations in Scholar (306 in ISI), enabling me to reach a h-index of 14 (10 in ISI). In fact, 10 of my publications (6 as first author) are included within the top 10% of papers in their areas of knowledge, according to ISI Essential Science Indicators.

I have shown a high capacity to obtain contracts or fellowships from competitive research programs (FPU, MEC-Postdoc, JAE-doc). I have actively participated in 21 research projects, 6 of them international and other 3 national projects applied in France. I have presented contributions to 45 congresses (half of them internationals).

PARTICIPATION IN INTERNATIONAL RESEARCH ACTIVITIES

Apart from my postdoctoral project in France, I am currently leading an European subproject that is integrated within a Life-Plus project. Additionally, I have actively participated in other 5 international projects funded by the 7th Framework Programme (7FP). A relevant part of my studies have been carried out in two experimental sites involved in the network of European infrastructures (within 7FP). Finally, I have organized an international workshop funded by the UNIA.

INDEPENDENT THINKING AND LEADERSHIPS QUALITIES

-Scientific production: I have demonstrated a high level of implication in my scientific contributions (see details above).
-Management of research projects: I have led two projects (one of them international) as a principal investigator.
-Organization of meetings: I have participated as a principal organizer of a parallel symposium within a nationally renowned Congress as well as of an international workshop at UNIA.
-Supervision of students: I have supervised two Ms-Theses, five projects of end of course and numerous undergraduate students. Currently, I am co-advising two PhD students.
-International mobility: I have been awarded competitive fellowships for stays in international research centres: a two-month stay in the

Open University (England), and a two-years contract in CEFE-CNRS (France).
-Relevance of my research line: I have been invited as a speaker for an international workshop. My research has been highlighted by the CSIC press office and has attracted the public media in many occasions (El País.com, El Mundo.es, ABC.es„ etc).

TEACHING ACTIVITY AND OTHERS
I collaborate as a teacher from 2012 in a Doctorate Programme at the Univ. of ﷺPablo de Olavideﷺ, and I have participated as a speaker during two years in a summer course in the Center for Forest Training of Vadillo-Castril (Cazorla). I also participate as a scientific officer of CSIC in the Guiding Board of "Natural Park of Cardeña and Montoro".
I have been recently invited as an editor for a special issue in Ecosistemas journal, and I have served as a reviewer for more than 15 SCI-journals.

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AYUDAS RAMÓN Y CAJAL
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Título:

Breeding for resistance to diseases in legumes by traditional breeding and marker assisted selection

Resumen de la Memoria:

My work focused initially on traditional breeding for resistance to diseases in legumes, mainly to the fungal diseases ascochyta blight and powdery mildew and to the parasitic plant broomrape in pea. I identified new sources of resistance to these diseases in germplasm collections and introgressed the resistance into pea varieties. Major achievement of this work was the release of the first two pea cultivars world-wide that are resistant to broomrape. I further studied the histology of resistance reactions against the pathogens and their inheritance. This work resulted in the identification of a new powdery mildew resistance gene, associated DNA markers enabling marker-assisted selection breeding, and the development of a resistant pea cultivar. To investigate the molecular mechanisms underlying the observed resistance reactions I applied a variety of transcription profiling technologies as e.g. qRT-PCR, microarrays, and SuperSAGE. Currently at the University of Frankfurt I am investigating the other part of the interaction, the pathogen. To this end I am applying next generation sequencing and bioinformatics to decipher the genome and transcriptome of Ascochyta rabiei, the causal agent of ascochyta blight in chickpea, and to unravel the pathogenicity factors of this fungus. In Spain I was employed at CSIC, IFAPA and the University of Córdoba where my PhD and postdoctoral work was supported by competitive INIA, Juan de la Cierva and JAE-Doc grants. My current work at Frankfurt is supported by a Marie Curie Intraeuropean Fellowship for Career Development. To develop my skills in diverse histological, statistical and gene expression methods I profited from four short term visits to internationally respected laboratories abroad in addition to my current two-years stay in Frankfurt. Already at the beginning of my career I demonstrated scientific initiative and intellectual independence designing new lines of research already in my PhD thesis. Currently I contribute with my ideas and management skills to three international projects where I serve as task leader. I supervised two PhD and a postdoctoral researcher and a technician and I am considered a prestigious researcher at the international level.

Resumen del Currículum Vitae:

In 1999 I got a CSIC "Introduction into Research" fellowship to develop my MSc thesis entitled "Identification and characterization of new sources of resistance to Mycosphaerella pinodes in Pisum spp." After I finished my degree as MSc in Agricultural Engineering, as the 4th best of my class, I worked at CSIC for one year. During this time I became responsible for a breeding programme for resistance to broomrape in pea, in which I am still involved, and I started new breeding programs for resistance to M. pinodes and Erysiphe pisi, which resulted in two pea varieties resistant to broomrape and one to E. pisi. In 2001 I obtained a grant from INIA for my Ph.D. thesis entitled "Pea breeding for resistance to broomrape, ascochyta blight and powdery mildew by traditional breeding and marker assisted selection" that I conducted at IFAPA. During this time I learned histological techniques from Dr. T.L.W Carver on two short visits at IGER, UK. I further acquired experience in molecular markers and QTL mapping. In particular, I was trained by Dr. S. Zatovic in QTL mapping during a short stay at the Univ. of Zagreb (Croatia). After finishing my thesis I worked for approximately 2.5 years in different projects at CSIC and IFAPA. In 2008 I obtained a "Juan de la Cierva" contract enabling me to start research in transcriptomics on plant-pathogen interactions in pea at the Univ. of Córdoba. I was initially trained in this subject by Dr. F. Krajinski during a two-months visit at the Max-Planck "Institute for Molecular Plant Physiology (Germany). In 2011 I won a competitive JAEDoc grant from CSIC, which gave me the opportunity to develop in my host group my own research line on pathology, transcriptomics and molecular markers in legumes, and supervise 2 PhD students, a postdoctoral researcher and a technician. To further increase my scientific experience I applied for and won a two-years Marie-Curie (IEF). Since May 2012 this grant gave me the opportunity to join Prof. G. Kahl"s group at the University of Frankfurt to expand my knowledge in application of Next-Generation Sequencing technologies and bioinformatics in plant-pathogen interactions. In Frankfurt, I am responsible for the technical and the administrative management of my Marie-Curie project. On the international level I served the scientific community as member of the Scientific Committee of the "European Association for Grain Legume Research", member of organizing and Scientific committee of the international congress "Ascochyta 2012", chairperson at 2 international congresses, task leader in three current FP7 projects, referee for several SCI journals and editor of the journal Legume Perspectives. I further participated in 8 international and 6 national funded projects. My scientific achievements are documented in 32 articles (23 SCI, 15 included in the first quartile of their areas) and 1 book chapter, being first or last author in the vast majority of them (81 %). I have passed the exams to obtain a permanent researcher position at IFAPA (2008) and at CSIC (2011), although I did not get the positions. I own ANECA accreditation as a Doctor Teacher.

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AYUDAS RAMÓN Y CAJAL
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Título:

Biotransformation of persistent organic compounds using tailored isolated fungal species

Resumen de la Memoria:

My research career has been mainly focused on "Microorganism and biodegradation". Since the beginning of my career, I have been interested in the processing and bioremediation of agricultural waste using fungi with the goal of decreasing its phytotoxic effect on plants in order to use them as amendments. After obtaining my doctoral degree, I focused my interest in the biodegradation of pollutants. I worked on the bioconversion of BTEX and chlorinated hydrocarbons by inducing hydroxyl radicals in white-rot fungi. In addition, I worked with polycyclic aromatic hydrocarbons, phenols and pharmaceutical compounds, using in vitro and in vivo systems and through the use of peroxygenases and peroxidases secreted by alkhaliphilic fungi.

During these studies, I have developed technical and analytical skills, such as those related to the elucidation of metabolic pathways or the optimization of biotransformation processes. Some of the better performing biocatalysts are fungi which can metabolize or co-metabolize a large range of xenobiotic substrates either by chemical modification or by influencing chemical bioavailability. However, it is my understanding that it is also necessary to study the actual soil-colonizing microorganisms, among which filamentous fungi are particularly interesting.

My main objective currently and in the near future is to explore the potential of the microorganisms isolated from direct contaminated sources and to use them to determine protocols for testing the bio treatability of different polluted sources. These microorganisms may have developed alternative enzymatic systems to degrade and chemically modify aromatic compounds or chemical structures that are present in agricultural soils. In addition, fungal metabolic degradation pathways of these compounds are yet to be completely understood, particularly in the case of filamentous fungi, which may either co-metabolize xenobiotic compounds or mineralize them. By achieving said goal, it will be possible to develop technologies related to the treatment of polluted waters and agricultural soils and technologies related to recycling and waste management by the use of fungi. This multidisciplinary research line combines microbiological, analytical and biochemical tools, and recently, I am applying cutting edge stable isotope analytics.

Resumen del Currículum Vitae:

I obtained a degree in Biological Sciences at the University of Granada in 2001. Since then, I started an interdisciplinary scientist career in which I gained an excellent background during the last 11 years.
I began my research career at the Estación Experimental del Zaidín EEZ-CSIC, (Pre-doctoral FPI fellowship from the MCyT). During my PhD studies I also worked at the University of Naples Federico II (3 months) and at the Mass Spectrometry, Proteomic and Biomolecular Institute of Avellino, Italy, CNR-ISA (3 months).
After obtaining my PhD in Biological Sciences by the University of Granada, Spain (2006), I performed a postdoctoral stay at the University of Alcalá de Henares (5 months). After this period, I took a Post-doctoral position at the Technical University of Dresden (International Graduate School of Zittau, Germany) for 26 months with an AECI and MICINN grants. In 2010, I took a JAE-Doc competitive contract at the EEZ (36 months). Currently, I work at the EEZ with a contract (18 months).
In my research career, I have participated in 9 projects: 5 from the national government, 3 from the Junta de Andalucía and one project associated to a Hispano-German Integration Action from the MICINN. I have published 27 SCI articles, being the first author of 13 and the senior author of 3. Out of the total 27, 14 of them rank within the first quartile of the total of journals in their category. These papers have received a total of 191 citations setting an h value of 8. Currently, I have 4 articles under revision and 1 in preparation. I am the first author of one book chapter. My research has led to the registration of 2 patents. I have participated in a total of 39 congresses and conferences with 49 posters, 6 proceeding book publications and 3 oral presentations, including an invited lecture in an international conference and two invited local conferences. I have established cooperation links with private companies such as multinational CLH, and Chilean organization CEAP. I have participated as a consultant for different agro-residue producing companies in Chile.
In my role as a supervisor, I have co-directed a PhD thesis (EEZ), a bachelor thesis (IHIZ-Germany) and 3 master theses (1 at the EEZ and 2 at the University of Guanajuato, Mexico). Currently, I am co-supervising a master thesis (EEZ) and a PhD thesis in cooperation with the Technical University of Dresden (EEZ-IHIZ). I have also supervised the work of students from Germany, Mexico and Colombia. I have been involved in teaching in Masters Courses about Environmental Microbiology (IHIZ-Germany) and, currently, I am participating in a master course of the University of Granada. I usually participate as external referee in SCI journals and I have also participated in a panel of

evaluation of a national project from Argentina. My involvement in transference of knowledge has been continuous. I have participated in conferences for the regional government and the publication of a popular science article. I have also participated in the award winning project "Innovation for the Education in High School" (PIISA 2012, PIIISA 2013). I hold the positive assessment of "Ayudante Doctor" by the ANECA since July 2012. As a final note, I would like to point out that I passed the two phases of the Competitive Examination for Associate Scientist Tenure at CSIC.

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AYUDAS RAMÓN Y CAJAL
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Título:

Nuevos Modelos y Sistemas de apoyo a la toma de decisiones para incluir el riesgo y la incertidumbre en la planificación de la gestión forestal. // Innovative Models and Decision Support Systems For Addressing Risk and uncertainty in Forest Planning.

Resumen de la Memoria:

In general lines, my research has focused on the analysis of climate change effects on natural resources and the development of forest management models and decision support systems to address risk and uncertainty. Following the same line, the aim of my research is to develop scientifically sound methods that might be used by the public administration, forest owners, industry and non-governmental organisations for enhanced integration of adaptive strategies in multiple-objective forest management planning. I intend to study the relationship between forest management and the risk of damage from disturbances, to develop tools that allow adaptive forest management (AFM) in order to minimise the risks associated to the global change (e.g. risk of fire, droughts). This innovative project may allow to: i) understand the impacts of climate change (CC) on natural resources and ecosystem services provision, ii) design optimal policies to address risk and uncertainties (e.g. fires, droughts, CC) over long periods and, iii) design cost-efficient AFM measures to mitigate the impacts of CC and to sustain multi-objective ecosystem management.

The proposed models, methods and tools developed in this research will consider different spatial scales, from the stand to the regional level. This will generate useful information for generating AFM alternatives. These tools will be used in strategic and tactical forest planning, in order to maximise the profitability of forest management in the medium to long term with regard to its economic, environmental and social value.

Methods and tools that may confront the complexity of forest management planning under changing conditions encompass (1) forest growth models (2) disturbances occurrence and damage models, (3) stand-level management scheduling models, (4) forested landscape management models (5) optimisation models and multicriteria decision analysis techniques to analyse trade-offs and (6) information and decision support systems. This project evolves a new approach to adaptive forest management planning by developing, testing and combining methods and tools (1) to (6). Emphasis is on the integration of these tools and incorporation of new techniques to develop and evaluate strategies that can adapt forest management practices to balance multiple objectives under changing conditions.

Four tasks will be undertaken: (1) Development of improved models for AFM including the evaluation of management options and risks (i.e. fire and pests). This will integrate process-based models, fire and pest occurrence and damage models. (2) Research of models and methods to assess and select AFM strategies. This task will integrate stand and landscape-level management scheduling models. (3) Research of Interactive Decision Maps (FGM/IDM) and multicriteria techniques. (4) Development of an innovative decision support system for AFM to test and run models developed in Tasks 1 and 3. This tool will include an innovative module to generate and visualise Pareto frontiers between multiple objectives to find efficient planning solutions. Thus, tasks 1 - 4 will be instrumental for providing up-to-date methods to the decision maker for actual use in strategic and tactical forest management planning. Potential end users as forest landowners and the forest industry will also be involved through case-studies.

Resumen del Currículum Vitae:

Academic degrees: Doctor of Philosophy (Ph.D.) Faculty of Forestry, University of Joensuu (now University of Eastern Finland, UEF) in 2007. Master (M. Sc) in forest sciences, Forestry University of Joensuu (now UEF), (Finland), 2005. Master in Forest engineering specialized in Silviculture, Universitad de LLeida (UdL, Spain), 2004. Master in Agronomy, (UdL, Spain), 2005.

Current position: Researcher at the Instituto superior de Agronomia (ISA), Centro de Estudos Florestais, Universidade de Lisboa. Deputy coordinator of IUFRO unit 4.04.06 – Nature Conservation Planning. Vice-Coordinator of the MEDfOR (Mediterranean Forestry and Natural Resources Management) Erasmus Mundus Master program.

Former positions: Post-doc researcher at the European Forest Institute (EFI), Joensuu, Finland (2007- 2008). Researcher at the University of Joensuu (now University of Eastern Finland), (Finland), 2007.

Teaching activity: Participated in lecturing 5 courses both Master and Bachelor level. :

- Forest Management and Certification

- Forest Policy and Land Management
- Multifunctional Ecosystem Management
- Applied Operations Research
- Multi-criteria decision methods for forest management and land-use planning

Scientific activity:

Research has focused on the understanding of climate change effects on natural resources and the development of forest ecosystem management models and decision support systems. The main objective is to develop scientifically sound methods that can be used by the public administration, forest owners, industry and non-governmental organizations for enhanced integration of adaptive strategies in multiple-objective forest management planning and for an improvement of existing policy and management approaches. This includes the development of innovative methods and tools that may address the complexity of multi-objective and multi-stakeholder forest planning under climate change and other risks (e.g. forest fires, pests). Research is/has been conducted in the framework of 13 European and 4 national projects. My experience as coordinator includes: i) coordination of an international project "ForEAdapt - Knowledge exchange between Europe and America on forest growth models and optimisation for adaptive forestry". Funded by the FP7 programme: FP7-PEOPLE-2010-IRSES, ii) coordination of a national project "Models and Decision Support Systems for Addressing Risk and Uncertainty in Forest Planning (SADRI) reference (PTDC/AGR-FOR/4526/2012), iii) Working group leader (WG2) of the Cost Action (2010-2014). "Orchestrating forest-related policy analysis in Europe" " ORCHESTRA (2013-2015), iv) Working group leader (WG5) of the ForestDSS Community of Practice, v) Deputy coordinator of IUFRO unit 4.04.06 " Nature Conservation Planning, vi) Vice-Coordinator of the MEDfOR (Mediterranean Forestry and Natural Resources Management) Erasmus Mundus Master program.
The results of my research in the area of forest management are documented in 29 papers published in ISI journals, 8 book chapters and presented in more than 25 talks at international conferences. Currently, I am co-editor of an international book to be published by the EFI and author of 3 chapters of another international book to be published by Springer. In addition, I am guest editor of special issues in two ISI journals (i.e. Forest Systems, Scandinavian Journal of Forest Research).