

SE OFERTA CONTRATO PREDOCTORAL PARA LA FORMACIÓN DE DOCTORES (FPI) EN EL DEPARTAMENTO DE MICROBIOLOGÍA DE LA UNIVERSIDAD DE MÁLAGA.

Se ofrece **Contrato Predoctoral para la Formación de Doctores (FPI)** dentro del grupo de **MICROBIOLOGÍA Y PATOLOGÍA VEGETAL** del Departamento de Microbiología de la Universidad de Málaga (Málaga), enmarcada en el segundo objetivo (AZUL) en el proyecto financiado por la Dirección General de Investigación Científica y Técnica (MICINN) **AGL2014-52518-C2-1-R** "APRENDIENDO DE LAS INTERACCIONES MULTITRÓFICAS EN LA RIZOSFERA DE AGUACATE PARA AVANZAR EN EL CONTROL BIOLÓGICO CONTRA ROSELLINIA NECATRIX"

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RESUMEN PROYECTO:

This coordinated project is aimed to get insight into various essential aspects for the biological control of avocado white root rot, caused by the fungus *Rosellinia necatrix*. The analysis of the individual components of this system will be studied under different approaches.

First, it is intended to address the pathogenicity of *R. necatrix* regarding the presence or absence of dsRNA and its relationship with the phenomenon of hypovirulence. This allows studies of dsRNA transfection between hypovirulent and pathogenic strains of this fungus and the implementation of pathogen virocontrol. Studies of novel antagonistic soil fungi from avocado escape trees, which do not show pathogenicity and seem to provide potential biocontrol of white root rot, will also be carried out. An in vitro study of the action of *Trichoderma* or rhizobacteria with the contact fungicide Fluazinam over the pathogen will be addressed and also field applications of this fungicide in infected established avocado orchards of southern Spain, will be assayed.

Secondly, the study on microbiological control agents will be improved. Thus, related to the rhizobacterial strains with biocontrol activity *Pseudomonas chlororaphis* PCL1606 and *Pseudomonas pseudoalcaligenes* AVO110, its genome sequence is already available and, using it, we will perform a search of genes potentially involved in several aspects of the multitrophic interactions during the biocontrol process, which will include studies about promoting plant growth (PGPR), chemotaxis, biofilm formation or transcriptional level studies of the interaction between different members of the system. Another approach include the elucidation of the microbiome of an agricultural soil which increases its suppressiveness after being amended with almond shell. A study of the microbiome sequencing techniques based on DNA and RNA techniques, as well as culture-dependent approaches will be carried out. From the potential results obtained, specific microorganisms would be selected and an artificial consortium of compatible microorganisms will be constructed that will constitute a synthetic community. On this artificially assembled community would be studied in detail the processes of interaction and control which may cause the final effect of biological control would be studied in detail.

Thirdly, the defence mechanisms of avocado plants and two model species, olive and strawberry, transformed with the AtNPR1 gene, a key factor in SAR response, will be evaluated. These studies will allow us to know whether, or not, there exist any similarities between the mechanisms of defence of the three species against this pathogen. Afterwards, avocado transformation with PaNPR1 will be undertaken. In addition, the selection of embryogenic avocado cells growing in the presence of crude filtrate of *R. necatrix* will be carried out as an alternative approach to get plants tolerant to this pathogen. Finally, the development of a system for in vitro conservation of embryogenic cells will be started, to store selected material without any loss of morphogenetic capacity.

The development of these sections in combination, will allow a better overview of the complex biological interactions occurring in the rhizosphere between the main living organisms involved in the avocado / pathogen / biocontrol agent system, and may help improve the design of integrated management programs of this and other crops.

Los candidatos deberán ser titulados superiores con conocimientos de microbiología, genética, biología molecular y/o ecología (Ingenieros Agrónomos, Licenciados en Biología, Ciencias Ambientales, Bioquímica, Biotecnología etc) y deberán mandar su solicitud junto con su CV y expediente académico a Francisco M. Cazorla, Departamento de Microbiología, Facultad de Ciencias, Universidad de Málaga (cazorla@uma.es).