



POLITÉCNICA



E.T.S. DE INGENIERÍA AGRONÓMICA,
ALIMENTARIA Y DE BIOSISTEMAS

Título de las prácticas (Title of the internship):

Regulation of fungal effector gene expression across diverse soils

Descripción de las funciones del alumno (Description of the student's tasks)

Plant-associated fungi, including pathogens as well as mutualists, secrete small proteins, typically referred to as effectors, to support their colonization of host tissues. Although essentially described as modulators of plant immunity, effectors may also function as antimicrobials antagonizing the growth of bacterial and fungal competitors in plant microbiota (Snelders *et al.*, 2022 - FEMS Microbiology Reviews). We suspect such antimicrobials to support fungal fitness in a broad diversity of environments, especially in soil, where microbial diversity is the highest. To characterize effector gene expression in soils, we sequenced the transcriptomes of three different fungi in extracts from 11 different soils, in presence and absence of soil microbes. After effector gene annotation in reference genomes and RNAseq read processing, you will (1) compare transcriptomes of the three fungi across different soils; (2) identify genes of which expression is affected by the presence of soil microbes; and (3) analyse effector gene co-expression. We especially aim to define families of co-regulated effector genes and identify candidate transcription factors underlying their regulation. We also aim to link effector gene expression patterns to soil microbiota profiles that have been determined with 16S and ITS sequencing.

Requisitos (Prerequisites): *(indicar titulación y curso) (give Grade and academic year); otros requisitos adicionales (idiomas, informática, otros conocimientos, etc) (other additional prerequisites (languages, informatics, other knowledge, etc))*

Student in the Computational Biology Master's program with:

- Proven proficiency in programming (e.g., Python and/or R) and familiarity with UNIX command lines
- Basic knowledge on microbiology and/or microbial ecology
- Basic knowledge of transcriptomics



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Proyecto formativo (Training Project)

Module EXTERNAL PRACTICES. The fundamental goal of the external practices is to guide the student in applying his previously acquired knowledge to real tasks in a group work environment the realistically represents the work conditions the the students will encounter in their future roles. In this way, the student will be able to get familiar with a working environment (work schedule, responsibility, attitude, organization, etc), and with the adequate working methodology in profesional reality, contrasting and applying the acquired academic knowledge.

Actividades a desarrollar en la práctica académica (Activities that will be performed in the academic internship):

- Transcriptome analysis
- Comparative genomics

Nº de plazas: (Nr. of places)	1
¿El alumno tendrá trato habitual con menores? (Has the student dealings with underage persons?)	No
Fecha de inicio: (Starting date)	01-02-2021



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Fecha de fin: (End date)	Flexible
Horas semanales: (Weekly hours)	Flexible
Horario jornada laboral: (Working hours)	Flexible
Importe Ayuda/Bolsa de estudio: (Amount of fellowship / remuneration)	€/mes
Tutor académico: (Academic tutor (UPM)) Email:	
Departamento tutor académico: (Dept. of academic tutor)	
Tutor empresa: (External tutor)	Prof. Bart Thomma/ Dr Fantin Mesny
Email tutor empresa: (Email external tutor)	bthomma@uni-koeln.de ; fmesny1@uni-koeln.de



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Departamento tutor empresa: (Dept. of external tutor)	Institute for Plant Sciences, University of Cologne
Ubicación de la estancia de las practicas (Location of the internship)	University of Cologne, Germany (telecommuting possibilities may be discussed)
ENTIDAD COLABORADORA: (Collaborating Entity)	University of Cologne
<i>A cumplimentar por Oficina Prácticas ETSIAAB:</i> Créditos a reconocer (Nº ECTS):	

Enviar por email a: OFICINA DE PRÁCTICAS ACADEMICAS EXTERNAS – ETSIAAB
secretaria.pei.etsiaab@upm.es – Secretarias: Visitación Pérez / Susana Pardo - Tfno: 913363686)