



Propuesta de Prácticas Curriculares

Título de las prácticas:

Studying unknowns of auxin signaling in plants using synthetic systems, computational structural biology, and lab-on-a-chip technologies

Requisitos: *(indicar titulación y curso); otros requisitos adicionales (idiomas, informática, otros conocimientos, etc).*

The student will engage in experimental work in the fields of bioengineering, structural biology, and synthetic biology under the guidance of Dr. Wabnik and other members of the PlantDynamics team. The student practice will provide an opportunity to explore the intersection of various scientific disciplines, including bioengineering, biotechnology, synthetic biology, and lab-on-chip microfluidics technologies. The focus of the practice will be on investigating the unknowns of phytohormone auxin signaling in plants using simplified in vitro cell culture systems.

Desired skills:

Experience with molecular biology techniques

Strong English language skills

Ability to work effectively in a team

Desirable: Experience with computer programming/scripting and familiarity with microscopes

Proyecto formativo

El objetivo fundamental de la Práctica Externa es guiar al alumno para que aplique en el mundo real sus conocimientos, destrezas y habilidades, en un entorno de trabajo en grupo, que reproduzca las condiciones que se pueden encontrar en su futuro lugar de trabajo. Las funciones y tareas a desarrollar en la Práctica permitirán ayudar al alumno a desarrollar sus competencias profesionales desde tres dimensiones: competencias técnicas (conocimientos técnicos propios de la titulación); competencias personales (comportamientos, comunicación, sentido de responsabilidad, compromiso y motivación, creatividad e iniciativa, implicación, trabajo en equipo) y competencias contextuales (capacidad de adaptación al contexto profesional)

Módulo TRABAJO FIN DE GRADO. El objetivo fundamental del TFG es la realización de un trabajo académico que demuestre que el alumno es capaz de aplicar los conocimientos y competencias que ha adquirido a lo largo de la carrera para tratar de resolver un problema, aprovechar una oportunidad o satisfacer una necesidad, de similar naturaleza y complejidad a los que pueda desarrollar en el ejercicio de su actividad profesional, eligiendo una solución que sea viable, tanto desde un punto de vista técnico como económico.

Actividades a desarrollar en la práctica académica:



The undergrad student will become an integral part of an international team of young researchers and will have an excellent opportunity to acquire a diverse range of cross-disciplinary skills. The overall goal of the research project is to gain a comprehensive understanding of protein translocation dynamics in auxin signaling circuits. This will be achieved through a combination of protein bioengineering, structural biology studies, and live cell imaging of synthetic protein circuits using microfluidics lab-on-a-chip technologies.

The student's responsibilities and tasks will include:

- a) Designing and implementing synthetic protein circuits, including the generation of mutants and performing protein engineering techniques. This will involve utilizing molecular biology techniques to manipulate and modify proteins to enhance their functionality.
- b) Investigating protein complexes that play a role in auxin signaling under controlled environments using microfluidics devices. The student will have the opportunity to work with cutting-edge microfluidics technologies to create precise and controlled experimental conditions for studying these protein complexes.
- c) Conducting live cell imaging experiments and analyzing the resulting microscopic data. The student will learn how to operate and interpret data from advanced microscopy techniques to visualize and track the behavior of proteins within living cells. The acquired data will be combined with other experimental results to input into computer models for further analysis.
- d) Developing and improving English language skills, as effective communication is crucial in the scientific community. The student will have the opportunity to interact with researchers from diverse backgrounds and present their findings in English, thereby enhancing their scientific communication abilities.
- e) Participating in regular lab meetings and engaging in brainstorming sessions with other members of the research team. The student will actively contribute to discussions, share ideas, and receive feedback, fostering a collaborative and intellectually stimulating environment.
- f) Integrating into the dynamic research activities of the Severo Ochoa center CBGP UPM-INIA-CSIC. The student will have the chance to engage with ongoing research projects, interact with other researchers, and immerse themselves in the vibrant scientific atmosphere of the center.

By participating in this student practice, the student will gain valuable hands-on experience in various scientific disciplines, acquire technical skills in protein engineering and microscopy, enhance



their English language proficiency, and contribute to cutting-edge research in the field of synthetic hormone biology.

Nº de plazas:	1
Fecha de inicio:	01/09/2023
Fecha de fin:	30/06/2024
Horas semanales:	25h
Horario jornada laboral:	9:30-14
Importe Ayuda/Bolsa de estudio:	€/mes
Tutor académico: Email:	Krzysztof Wabnik Krzysztof.Wabnik@upm.es
Departamento tutor académico:	UPM, Departamento de Biotecnología-Biología Vegetal
Tutor empresa:	
Email tutor empresa:	
Departamento tutor empresa:	
ENTIDAD COLABORADORA:	CBGP, UPM-INIA-CSIC
A cumplimentar por Oficina Prácticas: Créditos a reconocer (Nº ECTS):	

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