



**POLITÉCNICA**



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

### **Título de las prácticas (Title of the internship):**

Modelling gene-disease annotations using public gene expression datasets.

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

The main objective of this internship will be, through programmatic access to public databases of biomedical content, to obtain relevant information about gene expression and available profiles between diseases and genes. The intention is to automatize the process of extracting this information and store it in a database for further analyses. We want to process this expression data to extract relevant knowledge that can be used as annotations of disease-gene connections. Ultimately, the aim is to generate a comprehensive resource of publicly available information on gene expression that is related to diseases. That is, disease - gene associations with their corresponding annotations (which can be regarded as expression levels).

**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))*

Computational Biology Master student. Experience working with programmatic access to biomedical databases is a plus.

### **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 professional reality, contrasting and applying the acquired academic knowledge.

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

- Bibliographic review on computational methods for the extraction of disease-gene associations and their possible annotations.
- Literature review on the study of gene expression.



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- In-depth understanding of the GEO database (<https://www.ncbi.nlm.nih.gov/geo/>) and identification of other potential sources of information on gene expression and its associations with diseases.
- Understanding and getting used to the relational database of the DISNET project, which contains information on human diseases and the relationships between them.
- Definition of the methodology to be followed for the search of possible disease-gene associations and modelling of the possible semantics behind them.
- Design of the schema for the storage of the extracted data.
- Development of the automated computational processes for data extraction, data processing and knowledge storage in the database.
- Analysis of the extracted information and relation with the rest of the information already present in the DISNET project database.

<b>Nº de plazas:</b> (Nr. of places)	<b>1</b>
<b>¿El alumno tendrá trato habitual con menores?</b> (Has the student dealings with underage persons?)	<b>No</b>
<b>Fecha de inicio:</b> (Starting date)	<b>To be agreed with the student</b>
<b>Fecha de fin:</b> (End date)	<b>To be agreed with the student</b>
<b>Horas semanales:</b>	<b>25 – 30 h</b>



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<b>(Weekly hours)</b>	
<b>Horario jornada laboral:</b> <b>(Working hours)</b>	<b>To be agreed with the student</b>
<b>Importe Ayuda/Bolsa de estudio:</b> <b>(Amount of fellowship / remuneration)</b>	<b>€/mes</b>
<b>Tutor académico:</b> <b>(Academic tutor (UPM))</b> Email:	<b>Alejandro Rodríguez González</b> <a href="mailto:alejandro.rg@upm.es">alejandro.rg@upm.es</a>
<b>Departamento tutor académico:</b> <b>(Dept. of academic tutor)</b>	<b>Lenguajes y Sistemas Informáticos e Ingeniería del Software</b>
<b>Tutor empresa:</b> <b>(External tutor)</b>	<b>Lucía Prieto Santamaría</b>
<b>Email tutor empresa:</b> <b>(Email external tutor)</b>	<a href="mailto:lucia.prieto.santamaria@upm.es">lucia.prieto.santamaria@upm.es</a>
<b>Departamento tutor empresa:</b> <b>(Dept. of external tutor)</b>	<b>Medical Data Analytics Laboratory, Centro de Tecnología Biomédica</b>
<b>Ubicación de la estancia de las practicas</b> <b>(Location of the internship)</b>	<b>Centro de Tecnología Biomédica</b>



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<b>ENTIDAD COLABORADORA:</b>  (Collaborating Entity)	<b>Centro de Tecnología Biomédica</b>
<b>A cumplimentar por Oficina Prácticas ETSIAAB:</b> <b>Créditos a reconocer (Nº ECTS):</b>	

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