

CONVOCATORIA DE PRÁCTICAS INTERNACIONALES CALL FOR INTERNATIONAL INTERNSHIP

1. INFORMACIÓN DEL SUPERVISOR Host applicant information

NOMBRE Name

CARGO Position

CONTACTO Contact: Email Teléfono Phone

DEPARTAMENTO/FACULTAD/INSTITUCIÓN Department/Faculty/Institution

TIPO DE ORGANIZACIÓN Organization type

ORGANISMO PUBLICO SI Yes NO ORGANISMO SIN ANIMO DE LUCRO SI Yes NO
Public Body Non-Profit

TAMAÑO Size WEB

DISPONIBILIDAD PARA EVALUAR INFORMES DE CONVALIDACION DE CREDITOS ECTS

¿Es una prioridad para el supervisor que el estudiante valide los créditos?

Availability to evaluate ECTS credit validation reports

Is it a priority for the supervisor that the student validates ECTS credits?

2. DESCRIPCION DEL PROYECTO Project description

FECHAS ORIENTATIVAS DE REALIZACION DEL PROYECTO
Wished/approximate dates for the mobility period

FLEXIBILIDAD DE FECHAS SI yes
Flexibility in dates NO

TÍTULO DEL PROYECTO Project title

NUMERO DE HORAS DE TRABAJO POR SEMANA Number of working hours per week

PROGRAMA Detailed programme of the traineeship

Non-alcoholic fatty liver disease (NAFLD) is a world-wide disease with constantly increasing prevalence. One of the important players in the disease progression are monocytes and macrophages in the liver. The liver population of monocytes/macrophages consists of both embryo-derived resident macrophages (Kupffer cells) and circulating monocytes and monocyte-derived macrophages. During disease progression, circulating monocytes can be recruited to the liver tissue and further differentiate into different phenotypes, depending on the microenvironment. Expanded population of recruited macrophages is believed to affect progression, however exact mechanisms remains obscure. Almost all studies were performed on rodent models, which are significantly differ from humans in metabolism and immune system physiology. In vitro culture system enabling the study of the role of recruited monocytes/macrophages in the NAFLD pathogenesis are currently missing.

The aims of the project:

- establish co-culture system of circulating monocytes and liver organoids using recently developed at the HTH organ-on-chip system.
- evaluate phenotypic changes of primary human monocytes (CD14+) in co-culture with control and steatotic liver organoids.

ACTIVITIES ASSIGNED:

1. Differentiation of induced pluripotent stem cells toward hepatocyte-like cells organoids (3D HLC)
2. Culture of 3D HLC in microfluidic device in co-culture with circulating immune cells
3. Characterization phenotype of functionality of iHLC-on-a-chip by immunofluorescent staining, qPCR, ELISA and luciferase-based assay (CYP activity).
4. Analysis of NAFLD-related phenotype and metabolism, using confocal imaging. viability, LDH release, ALT and AST secretion tests, cytokines production.

CONOCIMIENTOS, HABILIDADES Y COMPETENCIAS QUE HAN DE ADQUIRIR LOS ESTUDIANTES

Knowledge, skills and competences to be acquired by the end of the traineeship

The intern will develop knowledge of the state-of-art methods of liver disease modeling and will learn about liver physiology and pathophysiology (non-alcoholic fatty liver disease)

SKILLS TO BE ACQUIRED OR DEVELOPED:

- hPSC culture and differentiation
- Generation of organoids
- Cell culture in microfluidic devices
- Imaging (confocal microscopy, live cell imaging)
- RT-qPCR
- ELISA
- Luciferase-based assay
- Data handling and statics

MONITORIZACION Monitoring plan

The intern will be closely supervised by the A. Aizenshtadt daily for technical questions. The supervisión plan also includes weekly meetings. Moreover, the intern will be introduced as a team member of the laboratory and, therefore, will receive training regarding essential cell culture and data handling according to laboratory SOPs.

EVALUACIÓN Evaluation plan

The intern is expected to write a short report about obtained results. If an intern needs Master thesis, he/she will get required supervisión and help in their preparation.

ESPECIFICACIONES ADICIONALES EN LA INSTITUCIÓN DE ACOGIDA

Additional specifications of the host institution

OTRA INFORMACIÓN RELEVANTE Other relevant information

3. PERFIL Y REQUISITOS DEL ESTUDIANTE Student profile and requirements

AREA/S DE ESTUDIO Research area/s

Molecular biology, Cell biology, Hepatology, Biomedical engineering

NIVEL DE ESTUDIO Level of studies

Completed bachelor degree (Biology, Biotechnology, Biochemistry, Medical biology etc)

REQUISITOS PREVIOS DE CONOCIMIENTOS TECNICOS O EXPERIENCIA

Student required expertise and technical knowledge:

Basic laboratory skills.
Knowledge of cell culture and aseptic techniques, qPCR, fluorescent microscopy will be an advantage

IDIOMA Y NIVEL MINIMO RECOMENDADO PARA REALIZAR LAS PRACTICAS

Language and minimum level recommended for internships

Ej. B2 en Inglés

REQUISITOS ADICIONALES DE LA INSTITUCION DE ACOGIDA

Additional requirements set by the host institution