Carlos Simon Foundation
FOR RESEARCH IN WOMEN´S HEALTH

CSF SUMMER SCHOOL FOR YOUNG SCIENTISTS

Microbiome Mysteries: Unraveling the Secret Roles of Bacteria in Pregnancy

June 30th - July 4th

Program leader

Dr. Inmaculada Moreno

Group: The Endometrial Microbiome in Human Reproduction

Description:

The endometrium, the inner layer of the uterus, far from being a sterile organ, harbors an ecosystem of microorganisms known as the endometrial microbiome. This microbial community, primarily composed of bacteria and fungi, plays a crucial role in women's reproductive health, influencing fertility, embryo implantation, and pregnancy development. Our research group has been a pioneer in describing the existence of the endometrial microbiome and its clinical implications in assisted reproductive technologies. Our goal is to apply molecular and cellular microbiology techniques to investigate the interactions between the endometrial microbiome and the human endometrium. The results could help us understand the functional impact of bacteria on the origin of infertility (implantation failure, recurrent miscarriage) and other pathologies (endometriosis, chronic endometritis). Moreover, this knowledge will facilitate the development of innovative therapeutic tools aimed at restoring an optimal endometrial microbiota.

Learning objectives:

- Understand the clinical implications of the endometrial microbiome in reproduction and endometrial pathologies.
- Gain knowledge on the impact of bacteria on host's reproductive tract physiology.
- Be informed about new therapeutic alternatives for endometrial infections.
- Get a thorough overview on the different molecular approaches and techniques being utilized in our lab to study the microbiota.
- Obtain first-hand knowledge from host-microbiota in vitro models to study endometrial physiology.
- Familiarise with computational pipelines commonly used for the analysis of microbiome data.

Carlos Simon Foundation
FOR RESEARCH IN WOMEN´S HEALTH

CSF SUMMER SCHOOL FOR YOUNG SCIENTISTS

Microbiome Mysteries: Unraveling the Secret Roles of Bacteria in Pregnancy

June 30th - July 4th

Provisional Outline Timetable:

30 JUNE

General introduction to the group and topic

- 9:00 - 9:30 | Welcome to the Carlos Simon Foundation. Introduction to our group and course presentation
- 9:30 - 11:00 | Introductory overview: Research in the female microbiome
- 11:00 - 12:30 | Group meeting: update on ongoing research projects
- 12:30 - 13:00 | Wet lab shadowing: getting familiar with our lab and techniques

01 JULY

Role of bacteria in the development of endometriosis

- 9:00 - 10:00 | Introduction to the topic
- 10:00 - 13:30 | Wet lab shadowing: Detection of bacteria in endometriosis patient's samples

02 JULY

In vitro models of bacterial-endometrial colonization

- 9:00 - 10:00 | Introduction to host-bacterial interactions.
- 10:00 - 13:30 | Wet lab shadowing: Bacterial colonization of 3D endometrium

03 JULY

The microbiome of the female reproductive tract

- 9:00 - 10:00 | Introduction to endometrial bacteria
- 10:00 - 13:30 | Wet lab shadowing: Bacterial growth and its applications

04 JULY

Bioinformatic analysis of the microbiome

- 9:00 - 13:00 |Dry lab shadowing: Taxonomical and functional analysis of microbiome data: 16S rRNA seq, WMS, integrative multiomics
- 13:00 - 13:30 | Diploma handout and farewell

(*) Please note that this is a sample program. Since this program follows a shadowing format, the proposed activities and schedules may vary depending on the progress or status of the research at the time the course is conducted.