

CSF SUMMER SCHOOL FOR YOUNG SCIENTISTS

The First Lullaby: A Mother's Connection with Her Child

July 14th- 18th

Program leader

Dr. Felipe Vilella

Group: Materno Fetal crosstalk in
Human Reproduction

Description:

We have explored how the mother communicates with the preimplantation embryo before implantation and discovered that the maternal endometrium influences the embryo's transcriptomics in both health and disease.

Our laboratory has demonstrated that specific molecules and extracellular vesicles are secreted by endometrial cells into the endometrial fluid. The embryo captures these signals before implantation, initiating the early stages of pregnancy. Our research focuses on gaining a deeper understanding of this critical dialogue between the embryo and the mother, laying the foundation for a novel preconception care concept.

Learning objectives:

- We will seek to understand the mechanisms by which the mother communicates with the embryo from the moment before pregnancy begins.
- We will understand which molecules are secreted by the mother's cells that the embryo recognizes and internalizes within its own cells.
- We will seek to understand what these molecules do inside the embryonic cells, how they affect them, and how they modify them.
- What can these molecules do? Participate in embryo implantation? Transmit genetic information?
- Could the mother transmit diseases? Could this be the origin of a disease that manifests in childhood or adulthood? And if so, could it be prevented?
- The student will learn cellular and molecular biology techniques to answer all these questions.





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Provisional Outline Timetable:

14
JULY

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: Maternal-Fetal Crosstalk
- 11:30 - 12:30 | Group meeting: update on ongoing research projects
- 12:30 - 13:30 | Wet lab shadowing: getting familiar with our lab and techniques

15
JULY

How the mother secrete cellular molecules

- 9:00 - 10:00 | Introduction to the topic
- 10:00 - 13:30 | Wet lab shadowing: tissue culture

16
JULY

In vitro models of endometrium of a chip

- 9:00 - 10:00 | Introduction to in vitro model
- 10:00 - 13:30 | Wet lab shadowing: tissue culture where this model is developing

17
JULY

Genetic and epigenetic embryo modification

- 9:00 - 10:00 | Introduction to endometrial bacteria
- 10:00 - 13:30 | Wet lab shadowing: Molecular biology lab

18
JULY

Bioinformatics Analysis of Maternal-Fetal Crosstalk

- 9:00 - 13:00 | Dry lab shadowing
- 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.

