



Carlos Simon
Foundation
FOR RESEARCH IN WOMEN'S HEALTH

3rd Edition

CSF SUMMER SCHOOL

FOR YOUNG SCIENTISTS



MOLECULAR MESSAGES: HOW THE MOTHER TALKS TO THE EMBRYO

29 - **03**
JUNE JULY

Description:

We have explored how the mother communicates with the preimplantation embryo prior to implantation and discovered that the maternal endometrium can influence the embryo's transcriptomic profile in both physiological and pathological conditions.

Our laboratory has demonstrated that endometrial cells secrete specific molecules and extracellular vesicles into the endometrial fluid. These signals are captured by the embryo before implantation, initiating the earliest stages of pregnancy. Our research aims to deepen the understanding of this crucial embryo-maternal dialogue, providing the scientific basis for a new concept of preconception care.

Program Leader

Dr. Felip Vilella

Group: Materno Fetal crosstalk
in Human Reproduction



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:



29 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 Maternal-Fetal Crosstalk
- **11:30 - 13:30 | Wet lab shadowing:** tissue culture in a organ on a chip model day 1



30 JUNE

HOW THE MOTHER SECRETE CELLULAR MOLECULES

- **9:00 - 10:30 | Introduction to the topic**
- **11:00 - 13:30 | Wet lab shadowing:** tissue culture in a organ on a chip model day 2



01 JULY

EPIGENETICS

- **9:00 - 10:00 | Introduction to epigenetics and its importance**
- **10:30 - 13:30 | Wet lab shadowing:** Molecular biology techniques



02 JULY

OVARIAN REJUVENATION

- **9:00 - 10:00 | Introduction to ovarian aging and rejuvenation techniques**
- **10:30 - 13:30 | Wet lab shadowing:** Tissue culture: cell transfection



03 JULY

ENDOMETRIAL DISEASES: ADENOMYOSIS

- **9:00 - 10:00 | Introduction to the disease, and current knowledge**
- **10:30 - 13:00 | Wet lab shadowing:** results and conclusions
- **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.