Carlos Simon Foundation
FOR RESEARCH IN WOMEN´S HEALTH

3rd Edition

CSF SUMMER SCHOOL

FOR YOUNG SCIENTISTS

IMAGING THE PREIMPLANTATION EMBRYO

27 JULY - 31 JULY

Description:

This intensive program explores advanced embryo handling and imaging techniques used in developmental and reproductive research. Through a combination of hands-on laboratory sessions, practical demonstrations, and guided data analysis, participants will gain in-depth experience in embryo thawing, fixation, immunofluorescence, live-cell staining, and confocal microscopy.

Program conductor
Dr. Emilia Scharrig
Group: Embryo Imaging

The course also integrates image processing and interpretation, providing a comprehensive understanding of how high-resolution imaging contributes to the study of early embryonic development. By the end of the program, participants will have a clear perspective on experimental workflows, technical considerations, and the analytical approaches required to generate and critically evaluate imaging-based research data.

Learning objectives:

- Gain familiarity with embryo handling and laboratory workflows, including thawing at different developmental stages and key technical considerations.
- Understand the principles and applications of embryo imaging in developmental research.
- Comprehend the basics of embryo fixation and preservation for downstream analyses.
- Gain understanding of immunofluorescence techniques, including staining and antibody selection for embryo analysis.
- Gain knowledge of live-cell imaging methodologies, including embryo staining and confocal live imaging.
- Understand the fundamentals of confocal microscopy, including image acquisition and resolution limits.
- Learn the basics of image processing and quantitative image analysis using specialized software.
- Develop the ability to interpret imaging data, considering experimental limitations and biological relevance.

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Provisional Outline Timetable:

27 JULY — INTRODUCTION

- **9:00 -11:00 | Welcome to the Carlos Simon Foundation.** Arrival at the Carlos Simon Foundation, introduction, and presentation
- **11:30 - 13:30 | Lecture:** Imaging embryos, what, how and when...

28 JULY — EMBRYO THAWING

- **9:00 -11:00 |** Thawing embryos in different developing stages
- **11:30 - 13:30 |** Embryos fixation and conservation. Immunofluorescence I

29 JULY — LIVE IMAGING

- **9:00 -11:00 |** Embryos staining for live imaging
- **11:30 - 13:30 |** Immunofluorescence II Confocal live imaging of stained embryos.

30 JULY — IMAGING

- **9:00 - 11:00 |** Embryos staining for live imaging. Confocal live imaging of stained embryos
- **11:30 - 13:30 |** Immunofluorescence confocal imaging

31 JULY — IMAGES PROCESSING

- **9:00 - 11: 00 |** Tools for image processing. Image analysis and interpretation
- **11:30 - 13:00 |** Discussion and closure
- **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.