CNC Advanced Courses 2021

Doctoral Program in Experimental Biology and Biomedicine (PDBEB)

January 18 – 29, 2021

Coordinator: Luísa Cortes (lcortes@cnc.uc.pt); CNC, UC

Location: UC-Biotech and CNC (FMUC, POLO I building)

Maximum number of students: 25

Aims

The aim of this course is to provide an overview of the technological platforms available at CNC. This two-week course will focus on the principles and high-end applications of the different methodologies and students will gain a theoretical understanding and hands-on experience on state-of-the-art equipment and on data processing and analysis.

Program

Week I – 18th-22nd January 2021 – UC-Biotech

Monday, 18th January 2021

9h30 - Welcome Session – Luisa Cortes (UC-Biotech Auditorium)

Transcriptomics to characterize cellular mechanisms: RNA-Seq (UC-Biotech)

10h00 - 11h20 - RNA-Seq: NGS and experimental design
11h40 – 13h00 - RNA-Seq analysis. Data processing and analysis

High-throughput/high-content screening (UC-Biotech)

14h00-15h00 - High-throughput/high-content screening: from basic principles to emerging technologies
15h00-16h00 - Case studies: from phenotypic screenings to biological knowledge
16h30-17h30 - Lab tour: overview of sample processing, image acquisition, image analysis workflows

Tuesday, 19th January 2021

Recombinant protein expression and purification (UC-Biotech)

09h30-10h45 - Cloning strategies: the old and the new
11h15-12h30 - Protein expression and purification: there is no such thing as a “one size fits all solution”
14h00-17h30 - Data analysis and discussion of case studies

Wednesday, 20th January 2021

R&D Antibodies (UC-Biotech)

9h30-10h30 - Developing antibodies for research, diagnostics and therapy using birds
11h00-12h00 - Visiting CNC's Avian Facility

Mass Spectrometry (UC-Biotech)

14h00 - Introduction to Mass Spectrometry and Liquid chromatography coupled to Mass spectrometry
- Quantification by Mass Spectrometry (Targeted and Untargeted approaches) - Vera Mendes
- Introduction to LC-MS/MS based proteomics
- Drug induced neuroproteomic changes
- Translational biomarker research

Thursday, 21st January 2021

Flow Cytometry

10h00 - 11h00: Principles of flow cytometry
11h15 - 12h00: Flow Cytometry applications
14h00 - 15h00: Fluorescence-activated cell sorting (FACS): principles and applications
15h00 - 17h30: Hands on cell sorting session – Susana Pedroire

Friday, 22nd January 2021

10h00 - 13h00 - Hands on cell sorting session and analysis – Susana Pedroire
14h00 - 17h00 - Hands on cell sorting session and analysis – Susana Pedroire
CNC Advanced Courses 2021

Doctoral Program in Experimental Biology and Biomedicine (PDBEB)

January 18 – 29, 2021

Coordinator: Luísa Cortes (lcortes@uc.pt); CNC, UC
Location: UC-Biotech and CNC (FMUC, POLO I building)
Maximum number of students: 25

Aims
The aim of this course is to provide an overview of the technological platforms available at CNC. This two-week course will focus on the principles and high-end applications of the different methodologies and students will gain a theoretical understanding and hands-on experience on state-of-the-art equipment and on data processing and analysis.

Program

Week II – 25th- 29th January – CNC polo I

Monday, 25th January 2021

Fluorescence Microscopy
09h30 - 10h30: Fundamentals of Fluorescence Microscopy
11h00 - 12h00: Optical Sectioning
14h00 - 15h30: Live Cell Imaging
16h00 - 18h00: Overview of widefield Microscope

Tuesday, 26th January 2021

Fluorescence Microscopy
9h30 - 10h30: Tips and Tricks on Fluorescence Microscopy
11h00 - 13h00: Overview of Confocal Microscope
14h30 - 15h30: Tissue Clearing
16h30 - 18h30: Overview of Spinning-Disk Confocal Microscope

Wednesday, 27th January 2021

Fluorescence Microscopy
9h30 - 13h00: Hands on microscopy sessions
14h00 - 18h30: Hands on microscopy sessions

Thursday, 28th January 2021

Fluorescence Microscopy
9h30 - 13h00: Hands on microscopy sessions
14h00 - 15h00: Introduction to IMARIS software
15h00 - 16h00: Introduction to deconvolution with Huygens software
16h30 - 18h30: Fundamentals of Imaging Processing with FIJI

Friday, 29th January 2021 – UC-Biotech

14h30 - 17h00: Students Presentations