Multi-scale study of 3D Chromatin structure ? 2nd edition

Overview

This workshop will introduce delegates to a Virtual Research Environment (VRE), created by the Multi-scale complex Genomics project (MuG), to facilitate the analysis and interpretation of the 3D and 4D structure of the genome.

The MuG VRE integrates a range of data from genome annotation to 3D folding and DNA flexibility. Recent studies have shown the role that genome organisation can play in gene expression and the VRE has been designed to provide a way of analysing such data.

The course will explore how to use the multi-scale features and integrated tools of the MuG VRE through the study of real biological examples.

Audience

The workshop is aimed at both experimental (bench-based) researchers and bioinformaticians; additionally it may be of interest to tool developers who wish to integrate their tools into the VRE.

Participants should have a Master’s degree or higher understanding of biology and have knowledge of genome organisation and the role it can play within the nucleus.

Requirements

Participants are expected to BRING THEIR OWN LAPTOP. (Please note an up-to-date version of Google Chrome is required to guarantee the correct performance of all tools featured in the course).

Syllabus, tools and resources

During this workshop participants will learn about:

- The Multi-scale complex Genomics project (MuG)
- The MuG Virtual Research Environment (VRE)
- Nucleosome dynamics
- Hi-C, interaction matrices and TADs (topologically associating domains)
- Protein-DNA interactions
Outcomes

After the workshop, participants will be able to:

- Navigate the MuG VRE
- Model and analyse a protein-DNA complex at the atomistic scale
- Process Hi-C data sets to produce interaction matrices and TADs
- Apply the MuG VRE to participants own data sets.


Speakers

Instructors:
Modesto Orozco (IRB Barcelona)
Federica Battistini (IRB Barcelona)
Jürgen Walther (IRB Barcelona)
Ricard Illa (IRB Barcelona)
Brian Jiménez (BSC)
François Serra (CNAG-CRG)
David Castillo (CNAG-CRG)

Barcelona Supercomputing Center - Centro Nacional de Supercomputación