

Gulbenkian Training Programme in Bioinformatics

3DAROC20

3C-based data
analysis and 3D
reconstruction of
chromatin folding

April 20th – 23rd
2020



Instructors

Marc A. Martí-Renom
CNAG and CRG,
Barcelona, ES

• • •

Marco Di Stefano
CNAG and CRG,
Barcelona, ES

• • •

David Castillo
CNAG and CRG,
Barcelona, ES

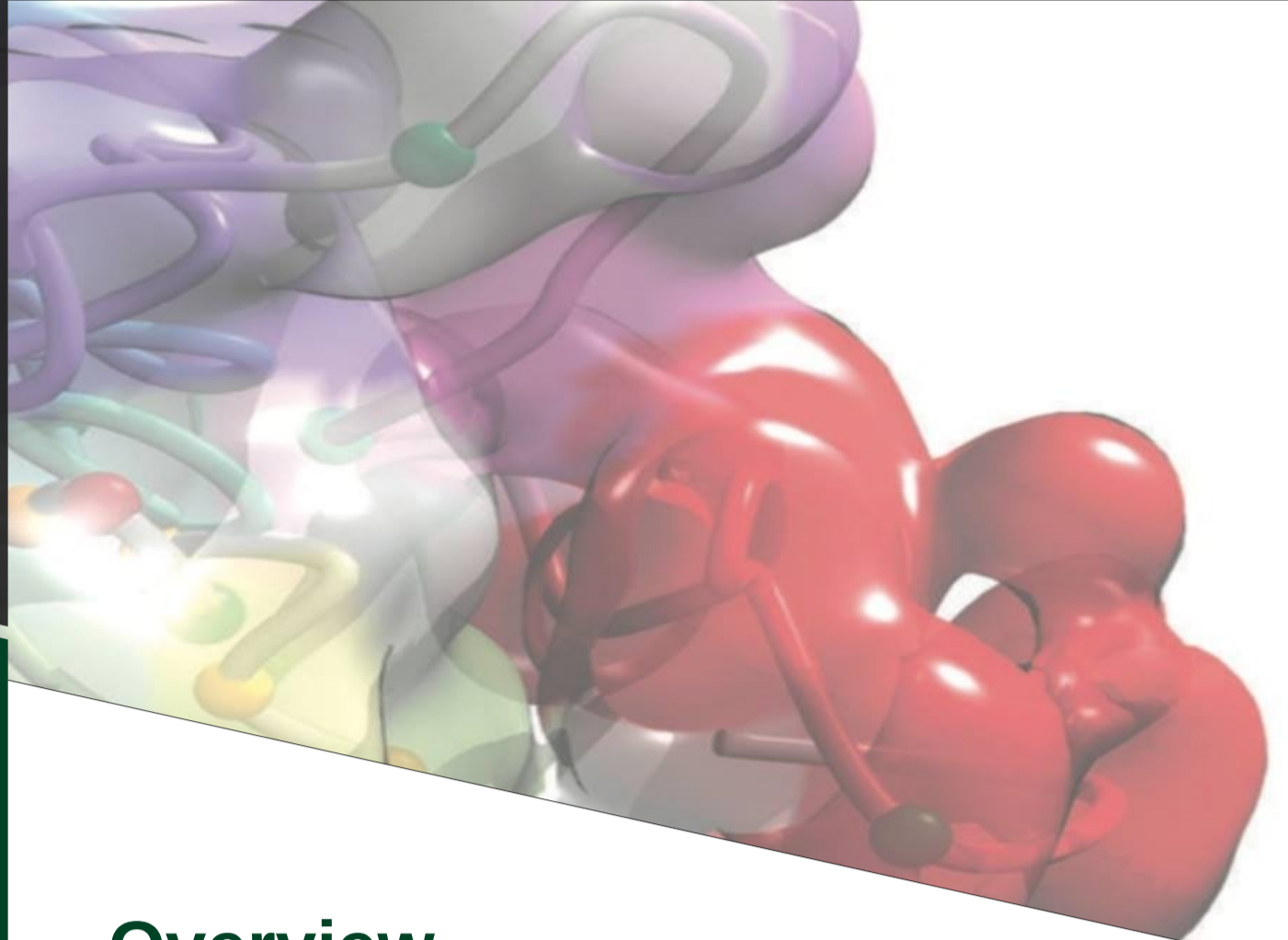


Organisers

Pedro L. Fernandes
Instituto Gulbenkian de
Ciência, Oeiras, PT

• • •

Miguel Cardoso
Instituto Gulbenkian de
Ciência, Oeiras, PT



Overview

3C-based methods, such as Hi-C, produce a huge amount of raw data as pairs of DNA reads that are in close spatial proximity in the cell nucleus. Overall, those interaction matrices have been used to study how the genome folds within the nucleus, which is one of the most fascinating problems in modern biology. The rigorous analysis of those paired-reads using computational tools has been essential to fully exploit the experimental technique, and to study how the genome is folded in space. Currently, there is a clear expansion on the wealth of data on genome structure with the availability of many datasets of Hi-C experiments down to 1Kb resolution.

In this course, participants will learn to use TADbit, a software designed and developed to manage all dimensionalities of the Hi-C data:

- 1D - Map paired-end sequences to generate Hi-C interaction matrices
- 2D - Normalize matrices and identify constitutive domains (TADs, compartments)
- 3D - Generate populations of structures which satisfy the Hi-C interaction matrices
- 4D - Compare samples at different time points

Participants can bring specific biological questions and/or their own 3C-based data to analyze during the course. At the end of the course, participants will be familiar with the TADbit software and will be able to fully analyze Hi-C data. Although the TADbit software is central in this course, alternative software will be discussed for each part of the analysis.

<http://gtpb.igc.gulbenkian.pt/bicourses/>



3DAROC20 Website



Funded by the Horizon 2020 Framework Programme
of the European Union



Co-financiado por:



UNIÃO EUROPEIA
Fundos Europeus Estruturais
e de Investimento

