

Theoretical and Practical HiC Workshop Schedule

Key: Wet-lab, bioinformatics, social

Monday November 4th

- 9:00-9:15 Welcome
- 9:15-10:00 Student introductions
- 10:00-11:00 Introduction to HiC
- 11:00-11:30 Coffee break
- 11:30-12:00 HiC protocol and plan for the week
- 12:00-13:00 Short talk by Dr. Hans Nuetzmann
- 13:00-14:00 Lunch
- 14:00-16:00 Intro to NGS
 - Illumina paired end sequencing
 - FASTQ format
 - HiC data
- 16:00-16:30 Coffee break
- 16:30-17:30 Sequencing QC
 - Quality control (fastqc)
 - Cleaning sequences (trimmomatic)

Tuesday November 5th

- 9:00-9:15 Protocol review
- 9:15-9:30 Coffee break
- 9:30-10:00 Preparation of plant material
- 10:00-13:00 Tissue fixation
- 13:00-14:00 Lunch
- 14:00-15:00 Short talk by Dr Kasia Oktaba
- 15:00-16:00 Mapping
 - BWT alignment (bowtie)
 - SAM/BAM format
 - HiC specific alignment (HiCUP digester, truncator, mapper)
- 16:00-16:30 Coffee break
- 16:30-17:30 Obtaining valid HiC pairs
 - Removing HiC byproducts (HiCUP filter)
 - HiC library quality metrics (HiCUP filter, HiCExplorer)

Wednesday November 6th

- 9:00-9:15 Protocol review
- 9:15-9:30 Coffee break
- 9:30-12:30 Nuclei isolation
- 12:30-13:00 Set up restriction reaction
- 13:00-16:30 Restriction reaction
- 13:00-14:00 Lunch
- 14:00-16:00 Overhang fill-in
- 16:00-16:30 Coffee break
- 16:30-18:30. Ligation

Thursday November 7th

- 9:00-11:00 Matrix construction
- Matrix binning (juicer, cooler)
- 11:00-11:30 Coffee break
- 11:30-13:00 Matrix correction
- Bias
 - Matrix balancing algorithms (juicer KR, cooler ICE)
- 13:00-14:00 Lunch
- 14:00-16:00 Data formats
- pairs, hic, cool
- Visualization
- 2D browsers (juicer, higlass)
- 16:00-16:30 Coffee break
- 16:30-16:45 Protocol review
- 16:45-17:30 Reversion of cross-link
- 19:00-21:00 Dinner in Irapuato

Friday November 8th

- 9:00-9:15 Protocol review
- 9:15-11:00 DNA extraction and gel electrophoresis
- 11:00-11:30 Coffee break
- 11:30-13:00 DNA extraction and gel electrophoresis (continued)
- 13:00-14:00 Lunch
- 14:00-16:00 Compartment Analysis
- PCA (HiCEXplorer)
- TAD calling
- TAD calling algorithms: TAD separation score (HiCEXplorer)
- 16:00-16:30 Coffee break
- 16:30-17:30 Peak calling
- Peak calling algorithms (HiCEXplorer)

Saturday November 9th

- 9:00-11:30 Differential interactions
- Between sample normalization (diffHiC)
 - Statistical testing (diffHiC)
- 11:30-12:30 Wrap Up